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H. B. McMEAL, PRESIDENT AND EDITOR — F. S. KENFIELD, VICE-PRESIDENT — H. D. FARGO, SECRETARY AND TREASURER
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Divorce the Western Electric.

Many times TELEPHONY has called attention to the unfair competition of the Western Electric Co. in the telephone field, so long as it is controlled by the American Telephone & Telegraph Co. We have declared it to be an unholy alliance and demanded in the interest of fair dealing in business, that the two interests be separated. Right now it is plainer than ever that this divorce should be accomplished voluntarily before the federal authorities issue a peremptory order compelling such action.

The administration at Washington is living up to the promises contained in the Baltimore platform which said: "We favor such legislation as will effectively prohibit the railroads, express, telegraph and telephone companies from engaging in business which brings them into competition with their shippers or patrons."

The insistent demand from the telephone field that the Bell-Western Electric interlocking combination be dissolved means that there will be no slacking up in this definite determination. The Independent Telephone Association of America, at its recent convention, passed the following resolution:

Whereas, we believe that the principle of competition in the telephone business should apply not only to operation, but also to manufacture and invention; and that it is for the best interests of every one concerned, that all operating companies, regardless of control or affiliation, should have the right to buy telephone apparatus and equipment in the open market; and,

Whereas, we believe that the operation of telephone properties and the manufacture of telephone apparatus under Bell management and control restricts competition, is detrimental to the general welfare, and is contrary to law and public policy; and

Whereas, we believe that the existing arrangement, whereby the American Telephone & Telegraph Co. and its subsidiaries are restricted in the purchase of apparatus and equipment to the products of the Western Electric Co. (also controlled by the American Telephone & Telegraph Co.) deprives the patrons of the Bell operating companies of the advantage of using the important telephone appliances developed by Independent telephone manufacturers; and,

Whereas, the tendency of monopoly has been to restrict inventions, as is so ably set forth in the following quotation from President Wilson's "The New Freedom:"

"Whenever there is monopoly, not only is there no incentive to improve, but, improvement being costly, in that it 'scraps' old machinery and destroys the value of old products, there is a positive motive against improvements.

"Can anyone who reflects on merely this attitude of the trusts toward invention, fail to understand how substantial, how great, how actual will be the effect of the release of the genius of our people to originate, to improve and perfect the instruments and circumstances of our lives? Who can say what patents, now lying unrealized, in secret drawers and pigeon holes, will come to light or what new inventions will astonish and bless when freedom is restored";

And we believe that the views of President Wilson are fully illustrated and demonstrated in the telephone field by the absence of substantial improvement made in Bell apparatus during the past 15 years; therefore be it

Resolved, that the officers and directors of this association take such action as may be necessary to secure and maintain competition in the manufacture and sale of telephone apparatus and equipment and in the development of inventions; and to that end to bring about a separation of the control of the Western Electric Co. by the American Telephone & Telegraph Co., so that the Bell operating companies may have the benefit of a competitive field for the purchase of apparatus and equipment; and to prevent general acquisition by the Bell organization or its agent, the Western Electric Co., of any manufacturing company, or patents, or shop rights under patents which acquisition will aid in monopolizing or tend to monopolize the manufacture of telephone equipment or apparatus.

The National Independent Telephone Association, at its last convention, adopted the resolution which follows:

We favor the enactment of such laws as may be necessary to prohibit any corporation, partnership or individual furnishing telephone service, from engaging in the manufacture or sale of apparatus, material or supplies.

In his message to Congress on the importance of curbing the trusts and aiding general business, President Wil-

son plainly showed that he is in deadly earnest. Several of his declarations in this message have direct application to the situation resulting from the combination of the Western Electric and the American Telephone & Telegraph companies.

Probably all of TELEPHONY's readers have read the President's message, but the following paragraph has a ring to it which cannot but gratify every Independent telephone man:

We are all agreed that private monopoly is indefensible and intolerable, and our program is founded upon that conviction. It will be a comprehensive but not a radical or unacceptable program, and these are its items, the changes which opinion deliberately sanctions and for which business waits:

It waits with acquiescence, in the first place, for laws which will effectually prohibit and prevent such interlockings of the personnel of the directorates of great corporations—banks and railroads, industries, commercial and public-service bodies—as in effect result in making those who borrow and those who lend practically one and the same, *those who sell and those who buy, but the same persons trading with one another under different names and in different combinations,* and those who affect to compete, in fact partners and masters of some whole field of business.

The spirit of the times demands laws that will put an end to the practices which have enabled the trusts to wage unfair competition, and President Wilson believes Congress will enact such measures. A law designed to cover such tactics as the government is determined to abolish, would undoubtedly lead to a separation of the Western Electric Co. and the Bell.

In all sincerity TELEPHONY believes these interests should anticipate the compulsory act and terminate their interlocking relationship of their own volition. They will have to do it sooner or later, and it will be better for them and the whole telephone industry, to have the segregation accomplished voluntarily and without further delay. The Bell has made a start in the right direction in its recent agreement with the government, and would still further clean its house by bidding the Western Electric Co. an affectionate but genuine farewell.

Where's Your Confidence?

By HERBERT KAUFMAN

Find yourself before you seek success! Show that you know. Prove that you aren't the slave of your brain, but its master.

When you can control your mind at will, handle it in any emergency, apply it to problems as fast as they arise, reason independently and convince us that you are an adept and agile thinker, we'll make way for you.

You carry within your head sufficient fuel to develop power for any undertaking, but before you can translate it into force, it must be lit with inspiration.

Life is a constant struggle between a courageous minority and a doubting majority who discount the feasibility of everything which has not previously been consummated.

If you won't bet yourself on your cause, how do you expect to inspire outsiders?

Somebody must begin every movement. You can't elect an outsider, captain of your career. Stand up for your convictions and you'll stand out of the crowd.

It takes time to secure followers, and the ambition which necessitates the support and co-operation of the many, is too trivial for consideration.

A single determined human, imbued with hope and supported by faith, can do anything within the range of possibility.

The world is ready to acknowledge your full worth, the moment you make a satisfactory exhibit. But if you hesitate in the background and evince doubt of your own stability, we won't waste time on you.

Believe that you can do it, persist in your belief, and you'll get an opportunity to prove yourself.

The strongest characteristic of all great men is indomitability—continuity of effort—stubborn adherence to a fixed and set plan or policy.

Call it what you please—audacity, nerve, bravery—after all, it is only confidence under another name.

There is a certain quality in men that lifts them head and shoulders above the mob. It led Clive into India, and inspired a handful of whites to conquer the brown hordes of Asia.

It placed the schoolboy of Ajaccio on the throne of France. It rendered the farmer soldiers of Washington superior to the trained troops of Britain.

It drove Peary to the pole. It fertilized the genius of all far-visioned benefactors of humanity. It is the very touch-stone of success.

Confidence is not a substitute for skill and knowledge, but without self-reliance, ability is wasted.

If you are right and have rights, battle for them. The coward always loses!

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The Little Big Things of Telephone Transmission

Long Distance Service Dependent Upon Transmission—Magneto Exchanges and Methods of Improving Their Transmission Efficiency—Improvements in Common Battery Transmission Efficiency—Paper Presented at Convention of Independent Telephone Association of America

By H. D. Currier

The Independent operating man has confronting him today the problem of long distance transmission with no qualifications as to the term "Long Distance." The following remarks are made with the hope of clarifying the subject in such a way that, firstly, its importance will be appreciated, and secondly, the methods of accomplishment may be outlined so that future practice will be conducive to the best results.

Definition of Long Distance Service.

The subscriber is interested only in the delivery to him of maximum efficiency for money paid. Traffic arrangements resulting in the fastest service are, I think, most contributory to satisfaction when considering local conditions; but in the handling of a long distance call, the ultimate definition of service is *transmission*. It is true that fast service in the establishment of long distance connections is desirable, but the fastest service possible will mean nothing if conversation cannot be carried on with ease after connections are once established.

The possibility of transmitting electrical energy over a line, resulting in volume of transmission which will permit of conversation with ease, is that volume of "talk" resultant when talking with a standard local battery telephone, using two new dry cells, through 32 miles of No. 19 gage cable, having a mutual electrostatic capacity of .06 mf. per mile, to another local battery telephone of like construction. This definition of transmission may not be accepted by some engineers, but I have found it correct for all practical purposes. With any make of local battery telephone now on the market, satisfactory transmission can be obtained under the above conditions, providing the dry cells are new. Some makes of telephones will require replacement of the dry cells more often, but the talking elements of all makes of magneto telephones are practically alike.

The magneto exchange is better prepared, today, to give proper transmission over long lines than the common battery exchange. The reasons for poor transmission with magneto equipment may be attributed to two causes. They are: Poor maintenance of dry cells at the sub-station, and the use of improper cords in the establishment of long distance connections. The telephone business follows fads and fancies. The use of non-hang up and non-ring through cord circuits in magneto boards has caused as much poor long distance service as all the poor maintenance of sub-station batteries combined. These non-hang up and non-ring through cord circuits were primarily designed for local service only.

Every magneto board should have enough toll cords installed to take care of the long distance traffic, and the plugs on these cords and the jacks with which they are associated on the toll lines, should be plainly marked. The best non-hang up and non-ring through cord circuit has a minimum loss of 3½ miles of standard No. 19 gage cable, and I have tested some circuits which had a loss of five miles of cable. This means that the possibility of conversation may be dissipated from 10.9 per cent. to 15.6 per cent. when local cords of the above character are used for long distance service.

It can readily be seen how cumulative losses occur when connections are patched through two or three exchanges and improper cords are used. Toll cords having no intervening equipment between the two plugs with the exception of one bridged clear-out drop of not less than 500 ohms resistance and preferably 1,000 ohms, should always be used in long distance work, when a connection is put up between a metallic local and toll line.

When connection is made between a metallic toll line and a grounded local line, a repeating coil must be used in the cord circuit. This repeating coil should be of the highest efficiency obtainable. I have found that the loss in repeating coils will range from 1½ miles to 5 miles of standard No. 19 gage cable.

The rural telephone has gradually become an important factor in the telephonic development of the country. The tendency of rural subscribers to listen on a line has not worked for much harm in so far as the eavesdropping is concerned. But this practice has materially affected the life of the dry cells, and in consequence, a push button which is normally open and included in the battery circuit, should be installed at the telephone. The subscriber should be compelled to hold this button down when talking. With this arrangement, it is possible for the subscriber to "listen in" on a line without producing battery dissipation. This may be taken as a radical statement, but in several places it has recently been installed and found to work with absolute success.

The Rural Telephone and the Listening-in Habit.

You cannot prevent rural subscribers from listening on a line. This is proven by the non-acceptance by the public of the various lock-out schemes which have been proposed in the past. The use of such a button will greatly reduce the cost of sub-station battery maintenance on rural lines by lessening the frequent battery replacement. An operating man separating his rural line maintenance cost, and then determining the proportionate amount of this cost represented in battery replacement, will be surprised at the result. The necessity of livery hire and the length of time involved in changing the batteries in a rural telephone, very frequently more than offset the earning power of the station. It therefore follows that the introduction of a battery cut-out button, which the subscriber is compelled to hold depressed while talking, will improve the standard of transmission obtained from these stations, and will also decrease the maintenance.

When the cells at a local battery station have been depleted so that there is a loss of 5 miles of cable, due to low current values in the transmitter circuit, and the line loss between the station and the central office amounts to another 5 miles of cable, and then it is considered that the connection may be extended through two exchanges with cord circuits having 5-mile losses, together with a terminal loss at the distant end of three miles, the total transmission dissipation under such conditions will amount to 23 miles of cable. Now if we consider the fact that 108.8 miles of No. 12 B. W. G. BB. galvanized iron wire is equal to 32 miles of No. 19 gage cable having a mutual electrostatic capacity of .06 mf. per mile, it can be seen that we could only talk a distance of 30.6 miles over a line of No. 12 B. W. G. BB. iron wire before we would reach the limit of commercial transmission, providing the cumulative losses referred to above existed.

The following table may be of value in determining the cable equivalents of the various sized line wire commonly used:

One mile of No. 19 gage cable having a mutual electrostatic

capacity of .06 mf. per mile is approximately equal to:

3.4 miles No. 12 B.W.G. BB galvanized iron wire;
4.3 miles No. 10 B.W.G. BB galvanized iron wire;
8 miles No. 14 N.B.S. hard drawn copper wire;
8 miles No. 12 B. & S. hard drawn copper wire; or
13 miles No. 12 N. B. S. hard drawn copper wire.

These values are used by the American Telephone & Telegraph Co.

Every Independent operating man should have an analysis made of his plant and determine the elements of transmission dissipation, both in his switchboard and in the outside construction. This is not an involved subject, and any wire chief can in a short time perfect himself in making transmission tests. The manager of every magneto plant should buy an artificial cable. Any telephone publication will gladly furnish information as to the cost of such an artificial standard, and where it can be obtained. When this standard is available, the various elements entering into a long distance connection can be defined in miles of cable.

Suggestions for Improving Transmission.

The battery button should be installed in each telephone. Local cords should be dispensed with in the establishment of long distance connections.

All repeating coils should be checked to determine whether their efficiency is the highest obtainable (it may be remarked here that only recently have coils of a transmission dissipation of not more than 1.5 miles of cable been available).

Toll lines should terminate on jacks of a different marking than the local line. Plugs on local cords should be used for local connections only.

The toll line construction should be considered in connection with the table of cable equivalents, as previously given.

When we consider that an investment of less than $100 in a switchboard will very frequently result in transmission benefit equal to thousands of dollars invested in outside plant, it is worth serious consideration.

The relation of the common battery plant to long distance transmission is a serious one. Some one has said that God was kind when he permitted the invention of the local battery telephone first, for otherwise our standards of accomplishment would be much below the level at present prevailing.

The signaling possibilities of a common battery switchboard, stimulated by traffic requirements, have overshadowed the transmission efficiency of these boards until we have at the present time switchboards developed to a high degree in traffic performance, but totally inefficient from a transmission standpoint.

The common battery switchboard being used in large local telephonic areas, has required the use of less cable to insure continuance of service when sleet storms prevail, and also to reduce the maintenance cost of outside construction. Cable in any form "eats up" transmission faster than any other element of a plant. Following the rule of all things from a cost standpoint, efficient cable costs more than inefficient. One mile of No. 22 gage cable having a mutual electrostatic capacity .08 mf. per mile is equal to 1.7 miles of standard No. 19 gage cable previously described. Cable has been sold having .12 mf. mutual capacity, and in such cases the ratio is almost 2 to 1 in favor of standard No. 19 gage conference cable. When we consider it is not uncommon to find six miles of No. 22 gage cable having a mutual capacity of .083 mf. in a long distance connection, and that six miles of this cable represents 30 per cent. of the possibilities of transmission under the most favorable conditions, it is no wonder we find it difficult to talk between cities closely associated.

All common battery exchanges should have a source of current supply which will permit of at least .2 ampere under the long distance condition, flowing through the transmitter on a zero subscriber's loop. This will require 48-volt battery plants, and cord circuits must be changed in most cases to permit of this current supply. The repeating coils in switching trunk circuits used for a long distance work should not have more than 1½ miles of cable loss.

I have found conditions where 43 per cent. of the possibility of transmission was dissipated between a telephone in a zero subscriber's loop and the toll line jack. When we take into account the fact that our terminal equipment should represent the minimum transmission dissipation, thus reserving sufficient efficiency to overcome our toll line conditions, and particularly when these toll lines are constructed with iron wire, it can readily be seen that serious consideration should be given common battery switchboards, and their functions in connection with long distance transmission.

The construction of common battery cord circuits which permit of connecting a common battery telephone with a toll line, and which introduce the sending dissipation of 43 per cent. as referred to above, are usually fairly good in receiving efficiency. It therefore follows that when an argument may take place between two exchange managers, to the effect that one cannot hear the other, the fault lies in the sending equipment and not in the receiving. In other words, when changes are made in cord circuits which result in the maximum sending efficiency, the receiving efficiency is taken care of.

The necessary steps to be taken in bringing about increased efficiency from the common battery exchanges for long distance service may be summed up in the following paragraph:

Install a 48-volt battery plant; change your cord circuits to permit of .2 of an ampere to the subscribers' transmitter when connected to a zero subscriber's loop; and install the most efficient repeating coils obtainable. When this is done, a great advance will have resulted in the efficiency of our common battery plants for long distance transmission.

Do not lose sight of the cumulative losses in a long distance telephone connection. Each mile of No. 19, .06 mf. cable represents over 3 per cent. of the possibilities of transmission. It therefore should be borne in mind, and particularly so in multi-office towns, to install cables having the least transmission dissipation.

It has become the practice of big operating companies to use cable constructed as follows: For trunk line work between exchanges, No. 13 gage, single paper insulation having an average mutual electrostatic capacity .072 mf. One mile of this cable is equivalent to .567 of a mile of No. 19 gage cable, .06 mf. capacity per mile.

Earnings of Keystone Telephone Co.

A comparative statement of earnings of the Keystone Telephone Co., of Philadelphia (combined companies), for the month ending December 31, 1913, and for the 12-month period, is as follows:

	For Month Ended		For Twelve Months Ended	
	Dec. 31, 1913	Year Previous	Dec. 31, 1913	Year Previous
Gross earnings	$107,695	$106,480	$1,265,779	$1,217,429
Operating expenses and taxes	53,968	51,859	640,206	609,068
Net earnings	53,727	54,621	625,573	608,361
Less interest charges	26,040	25,803	306,495	302,616
Net surplus	27,687	28,818	319,078	305,745

Novel Telephone Advertising.

L. H. Meyer, manager of the Chicago Telephone Co. at Gary, Ind., is suggesting in his newspaper advertising that the long distance telephone offers the right method of offering congratulations to the newly married, parents of the newly born, birthday celebrants, and silver or golden wedding principals. "It preserves the intimate, friendly touch," he suggests.

An Evening with the Roadman and Some Experiences

His Visit with the Manager of the Zenalia Exchange—A Case of Cross Talk that Puzzled the Manager and How the Roadman Located It—Cause of the Trouble Found in Improper Wiring of the Operator's Circuit—The Explanation

By H. Livingston

"Where is the manager?" asked the Roadman, as he called into the exchange at Zenalia from the pay station at the junction. The manager's tones were cheerful as they came from the receiver, saying:

"Hello Al! My, but I am glad to hear from you. I have been expecting you for several days. They wrote from the office that you would be here soon. Now, I am having a case of cross talk down here, and I have tried and tested all sorts of ways, and can't seem to get it. I hope you will be able to land it for me."

"All right, Mr. Charles, we will find that trouble; I will be in on the 5:30 train, and after supper we will go over and find it. I called in to make sure you were not out of town. What is your trouble, bad cable or improper transpositions, or poor insulation?"

"No, it's not that; the trouble is in the switchboard and I can't locate it."

"Very well, we will get that cleared up tonight, all right."

Reaching Zenalia at 5:30, the Roadman went to the hotel, and after supper walked down to the central office. The switchboard comprised a two-position magneto section, each position having 15 pairs of cords with ringing and listening keys, but no ring-back keys. There was also a position strap key for connecting the listening circuits so that the two position could be handled by one operator.

The manager explained that on certain lines he got cross talk at times—sometimes it would be worse than at others. He had made tests of the listening keys to see if any of them were leaking, but had found nothing there that seemed wrong. He had tested the different lines on which the trouble had appeared and found no faulty insulation or crosses between them. In the same way he had been over the lines, cable terminals, cable conductors, main frame, switchboard cable and line jacks on the board; still he could not clear the trouble, and naturally enough he had come to the conclusion that the fault was in the board. Having once tested the listening keys, his suspicions next fell on the keyboard cables. He thought perhaps they might be defective and leaky. But on brief consideration he saw that this was hardly reasonable, as the whole operating room was as dry as a bone. So he was at a loss to explain the trouble in any way.

After having absorbed all the details of what was wrong,

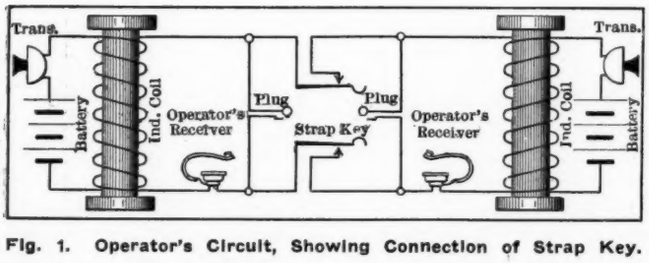


Fig. 1. Operator's Circuit, Showing Connection of Strap Key.

and what efforts had been made to locate the trouble, the Roadman first of all examined the strap key.

From the circuit sketch shown in Fig. 1 it can be seen clearly that if this key had been a little out of adjustment so that one or both sets of springs did not clear as they should when the key was normal, the contact would produce the very trouble which existed. However, this did not seem to be the case, as there was a sufficient clearance between both sets of springs to permit the free passage of a piece of paper between them. Neither was there any evidence of any loose pieces of solder which might cause the trouble. However, the trouble might have been caused by acid getting on the rubber insulating strip which carried the key springs, or some of the insulating pieces or bushings might have become carbonized

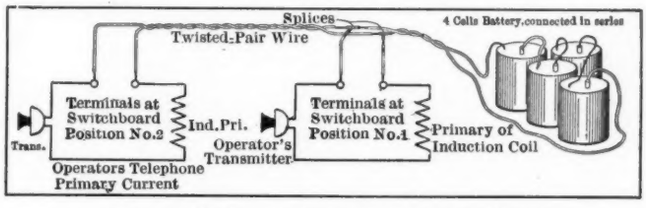


Fig. 2. Wiring of Operators' Transmitters.

by the power generator current which might possibly have found its way through this particular key. The carbonizing of the rubber would have lowered the insulation resistance to a point where voice currents could have leaked across it.

Accordingly, the next move was to heat a soldering copper and remove the four wires entirely from the key, leaving them in such positions as to preclude any chance of their accidentally getting together. Then while the night operator called up the subscribers on some of the lines upon which the cross talk had appeared, the Roadman listened at the second operator's position to see if the removal of the strap key had stopped the trouble. To his surprise, it had not done so. Turning to the manager, he asked, in close succession, questions to bring out information as to the kind of batteries used for the operator's transmitter; the number of cells for each position; their location; how the wires were run from the batteries to the board; the size of the wires; the kind of insulation; whether the wires were single or paired; and how far the batteries were from the board.

Mr. Charles replied, "I am using four cells of Gordon batteries in porcelain jars. I keep them over there on one of the shelves of that closet which, as you see, is only 10 or 12 feet from the board. The wires run along that iron cable rack, and they are about No. 18 B. & S. gauge, with an insulation of two silk coverings and one of cotton, the latter covering also being paraffined. These wires are twisted pair."

"All right, Mr. Charles, I want to look at those batteries and see how the wires run to the board. Why have you four cells? You know it is usual to use three cells of battery per position, which would make six in all for the two positions."

"Well," replied Mr. Charles, "I use four cells because I get better results. I find that my transmitters 'come up' better that way, and I always like to have an operator's set talk up in good shape."

"Now, Mr. Charles, please tell me how you have those four batteries connected up. Do you have two cells working on each position? Also, tell me how the other pair of battery wire runs. I see only one pair running along here."

"Why," said Mr. Charles, "I have all four cells connected in series and then run one pair of wires from them straight to the first position."

"Yes," answered the Roadman, "but where do you get your battery for the second position?"

"When I put in those batteries, I just ran one pair of wires to the first position, and then tapped on a pair in multiple and led it off to the second position."

The sketch in Fig. 2 will serve to illustrate more clearly just how the circuit was wired.

"Very well, Mr. Charles," said the Roadman. "Now, if you

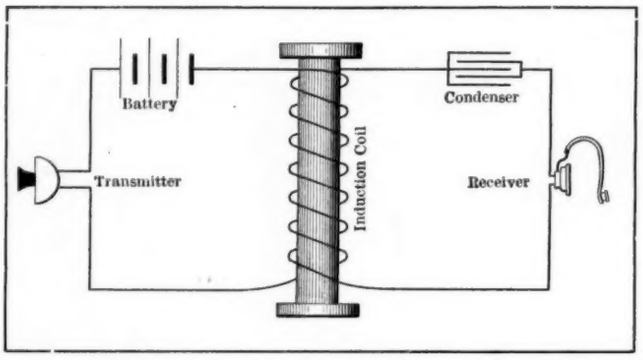


Fig. 3. Circuit to Illustrate Principle of Cross Talk Trouble.

will get me about 10 or 12 feet of twisted pair, I will clear your trouble for you in about three minutes."

"The first thing to do is to rearrange those batteries, and at least for the present, put two cells, connected in series, on each position. We will then run a second pair from one of these sets of two batteries to the second position, allowing your original circuit to position No. 1 to remain as it is, after we have removed the multiple tap to the second position.

"You will see now, Mr. Charles, that, as you had the circuit wired, you had both operators' sets connected to the same pair of wires, over which current from the battery flowed to each transmitter circuit. You also know that the induction coil as it is used in ordinary magneto work, is nothing but a step-up transformer. Now when operator No. 1 talked, the vibration of the diaphragm of her transmitter would cause an increase or decrease in the compression of the carbon granules between the front and back electrode in the carbon chamber, thus varying the resistance of the circuit. Hence there would be a corresponding increase or decrease in the amount of current flowing through the primary winding of her induction coil and this in turn would cause variations in both the intensity and the direction of movement of the field of force.

"These differences and fluctuations would be most faithfully and minutely reproduced in the secondary winding on account of the field of force expanding and contracting from the core as a center and passing through the secondary winding. Keeping these points in mind and remembering that you had the other operator's primary circuit in multiple with the first one, you can readily see that a certain part of the fluctuations will also find their way to and through the primary winding and transmitter of the second operator's set. This, of course, would induce a current in the secondary winding of that coil. As the operator's receiver is in series with this winding, it would be actuated. There you have the explanation of your cross talk trouble."

"Now, look here, Al," said the manager, "I want you to tell me how it is that you are going to get a circuit through the secondary and head telephone at the second position. We could get that cross talk very faintly, but clearly, without any listening keys thrown on the No. 2 position, and by throwing any listening key on that position could hear more clearly. Yet, in either case, there was nothing to close the circuit between the end of the secondary that goes to the sleeve of the cord circuit and the side of the receiver that goes to the tip of the cord circuit."

"Oh, yes, I see what's bothering you," said the Roadman. "Now, look here! You know that if you had had no keyboard cable or clearing out drop or anything of the sort connected to the receiver and secondary, but had placed the secondary, the receiver and a condenser in series, you could have heard all right. Yet you have no metallic connection. Here's a sketch (Fig. 3) of the circuit.

"You know, Mr. Charles, that you do that same thing in principle when you use a telephone which has a condenser wired into the secondary in order to prevent ringing on bridging rural lines where the people will persist in leaving their receivers off the hook. Of course, there is not a great amount of capacity in the keyboard circuit, which multiples along from key to key and is known as the listening key strap, but a telephone receiver is such a delicate instrument, and so susceptible to operation by infinitely small amounts of current, that you might hear faintly by listening closely. Then, when you threw the listening key, you added the capacity of two 6-ft. cords and two plugs."

"Yes," broken in the manager, "that's right, and also the clearing out drop is in that circuit."

"No, Mr. Charles," replied the Roadman, "you are wrong there. It is true there would be a circuit through that way, but you forget that the clearing out drop is also an impedance coil. That is, it acts just the same way as the ringer coils do in one of the telephones out on your bridging country circuit. Any alternating currents, and especially those of high frequency, would take almost any path rather than through that coil wound on an iron core. In fact, a properly designed and proportioned impedance coil is just as much a barrier to voice currents as the condenser is to a direct current. So you see you have in reality in this case of the cord circuit a combination of the two factors of capacity and impedance. It is just as if you had a circuit like this (Fig. 4), only instead of actually having the condenser, you have a capacity between the tip and sleeve conductors of the cord circuit."

"Well, Al," said the manager, "it looks as though that thing was so easy that I should have cleared it myself. Why, I ought to have known better than to do such a silly thing as that; in fact, I would have known better, if I had only stopped to think about it."

"Don't you get to feeling bad about that, Mr. Charles," consoled the Roadman, "we don't any of us know it all about the telephone business, and we all make mistakes, too. This business is so essentially a matter of detail that if any given matter connected with it had one thousand details, and of these nine hundred and ninety-nine were correct and the other one wrong, the whole affair would be liable to work wrong. Now let me tell you another cross talk story. This may seem to you like a fish story, but I could give you the day, date and place.

"Not long ago I went to visit a man who had a small exchange of some 200 subscribers. Finding the superintendent

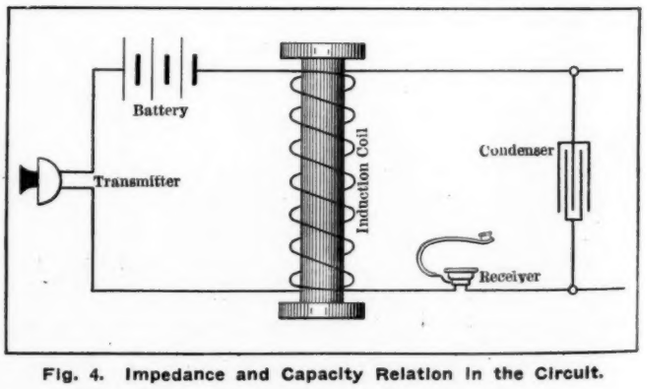


Fig. 4. Impedance and Capacity Relation in the Circuit.

was not in, I quietly looked over the office equipment, etc. When the man came in I handed him my card, and told him the object of my call. When the opportunity arose, I asked him if he had any cross talk trouble. 'Why, man,' he replied, 'it's the worst thing I have to worry me, and I cannot seem to help it any either.'

"'Well, Mr. Newton,' I answered, 'you could practically stop it all if you went at it properly.' He seemed to be from Missouri, so I said: 'All right, you come over here, and I will show you where you can start to good advantage.'

"He had a homemade criscross frame which was a sort of a skeleton affair built of wood. Upon horizontal strips about 2½ inches wide, were mounted brass lugs, each having two ears to which the leads were soldered. There were two sets of these brass punchings, one for the wires to the arrester, the other for the switchboard cable. The whole affair was very crude, but the great defect was that it had all the centers for the punchings laid out with a lead pencil. And, will you believe it? Even after I had showed him this fault, he wanted to know what difference it made. I had to explain to him that the lead of a lead pencil was really carbon, and that it was no more strange he should get cross talk over a lead pencil mark than it was that he was able to talk by aid of a transmitter whose action depended upon the ability of carbon granules to conduct electricity.

"After driving that little argument home, I conducted him over to the arrester frame, and inquired whatever possessed him, as a sane rational being, to put his paper cable into service without potheads. In fact, the cable conductors were taken to the arrester terminals with nothing but the paper insulation on them. They were not even boiled out and paraffined. If he could not have secured a pothead, he might at least have boiled out the ends thoroughly, and in the absence of cable compound, taped it well and then have given it a good liberal coating of shellac. When I asked him why he hadn't taken care of it properly and used the pothead, he said he never heard of such a thing. He wanted to know what it was, how it was made, how used, why necessary, etc. Now, wouldn't that jar you? So the next thing in order was a little discussion as to the whys and wherefores of the proper care and handling of paper cable. Why, he didn't even realize that a wet spot on a cable would give cross talk!

"So you see you needn't feel one bit bad, Mr. Charles, because of your little cross talk trouble. It's eleven-thirty now, and I am going to bed. Good night."

The Government Anti-Trust Suit.

The hearings before Miss Mary E. Bell, special examiner for the federal court at Portland, Ore., in the government's anti-trust suit against the Bell companies of the Pacific Northwest proceeded in Philadelphia last week. On January 12. John C. Lynch, general superintendent of traffic of the Bell Telephone Co., of Pennsylvania and affiliated lines, was questioned as to discrimination by the Bell in favor of the Western Union Telegraph Co. as against the Postal Telegraph Co. He denied that such discrimination exists. He said it would be impossible to discriminate against either company. He admitted having heard of the complaints of such discrimination by the Postal company. Asked by C. J. Smyth if he had ever heard of the Western Union making a complaint similar to the Postal company, he replied that he never had.

He said that if there were such discrimination the operators would have to know about it and as they were constantly leaving the company, the news would soon get out. He said the company educated the operators to refuse to connect a subscriber with either telegraph company until the subscriber designated the company desired. Test calls are made all the time to see if operators are obeying orders. The company loses, the witness said, 600 operators each year because they are just at the age when they leave, to get married.

To demonstrate that the Bell company gives as efficient service in cities where there is no competition as in cities with competition, Mr. Lynch gave data to show that in Philadelphia, where competition exists, the service is below the standard established in New York, Baltimore and Washington, where there are no competing companies. He said competition had nothing to do with his company's efforts to improve its service. Mr. Lynch stated that the operators' answering time in Philadelphia averaged 3.7 to 3.9 seconds. The witness said the average in New York was 3.4 seconds, in Baltimore 3.6 seconds and in Washington 3.4 seconds. He said that an attempt was being made to better the service in Philadelphia. The delay, he declared, was due to the use of coin boxes.

J. Heron Crosman, Jr., general commercial superintendent corroborated the testimony of Mr. Lynch. In direct examination Mr. Crossman denounced the ethics and practices of Independent telephone companies, favored the elimination of competition in the telephone field, and condemned the constitutional prohibition in Pennsylvania against the merging of competitive enterprises. He declared that monopoly under government regulation was the ideal condition. He denied knowledge of any cases in which the Bell company acquired Independen companies in violation of the anti-merge provisions.

On January 13 S. R. Caldwell, of Philadelphia, who, during the past 15 years, has been connected in the capacities of treasurer, director and manager with 25 small telephone companies in Pennsylvania and neighboring states, said that many of these companies were capitalized by issuing bonds in small denominations, with glowing prospectuses appended, and that these bonds were purchased by small investors, who were attracted by the easy terms of the investment and the generous portions of bonus stock offered. Today these bonds have absolutely no market value, the witness declared. The witness sketched the history and methods of the American Union Telephone Co. which paid no interest after 1909 and finally failed. He said the service furnished by Independent companies was not good because of faulty equipment. Other witnesses on this date were Eugene Bigler, local manager of the New York Telephone Co. and Lanning G. Roake, superintendent of the Water Department of Peekskill, N. Y., testified as to the delinquincy of the State Line Telephone Co. in the payment of taxes and water rent. Mr. Bigler admitted that his fare to Philadelphia had been paid by a representative of the New York Telephone Co.

On January 14 Albert E. Berry, Philadelphia, manager of the Philadelphia division of the Bell Telephone Co. of Pennsylvania, declared that the per capita number of telephones in Philadelphia would exceed that in New York, were it not for competition. He said that in Philadelphia there are 8.3 Bell telephones per 100 of population, whereas in cities where there is practically no competition, the percentage is greater. In New York there are 9.2 telephones per 100 of population, in Boston 11 telephones and in Washington, D. C., 13.7 telephones. Mr. Berry is also quoted as having testified that if all the telephones in Philadelphia were operated under one system the public would be able to secure service at a less cost than it does at present. He said there were 142,600 Bell telephones and 29,000 Keystone telephones in Philadelphia.

On January 15 C. J. Smyth, special assistant attorney general, in charge of the government's case, left hurriedly for Washington to confer with Assistant Attorney General Todd.

Omaha, Neb., Second in Telephones Per Capita.

The Omaha Bee says that while Omaha is the forty-third city in the United States in point of population, it is twenty-second in point of number of telephones, and second in point of telephones per capita. The city claims one telephone for every five inhabitants, or a total of 31,330 telephones in Omaha proper.

Convention Echoes

Some Sidelights—The Decline of Monopoly—The Necessity of Fair Dealing, Etc.

By J. C. Kelsey

Well, it is all over! Two conventions make a whole lot of work. Show me the exhibitor who was not fully exhausted.

There never were so many prospective buyers at a convention before—neither were so many orders taken. I don't believe manufacturers ever saw revealed so much prosperity ahead.

The Independent telephone manufacturer did not spring into the world, full panoplied as Pallas Athene.

He had to work his way slowly. He had little to gain and everything to lose. He had faith in the future, principally. He has been the life of the telephone movement.

Having something to sell, he naturally has to find a buyer. In his anxiety to find buyers, he probably was too zealous. In other words, he has trained a line of customers who demand and get the very best service, terms, as well as apparatus. But the relation should not cease at this point.

There is something ahead. The manufacturer is not merely a seller. The mere purchase of his goods does not terminate your relation. He should be encouraged to go on and make progress for you.

Just at a time when the telephone business began to look real hopeful, the Bell monopoly genius threw open the gates of the Bell factory.

At the same time every Bell employe was made an honor salesman, instructed to preach and advocate the use of Bell apparatus with the same zeal that a Christian missionary goes after Confucianism.

Every device was used to beguile, coax, threaten and destroy, and in a measure they have been successful, for some of you are buying Bell factory apparatus.

At the Kansas convention, I noticed that the telephone men most suspicious of the Bell company, were exclusive buyers of Bell equipment. All the time they are manfully fighting the Bell operating company, they are exclusively supporting the Bell manufacturing company. Can you beat it?

No doubt these men are sincere, but human beings have always stood in their own light.

I am going to leave this manufacturing topic to the last. I want to discuss the general telephone situation.

You know all about the Bell letter and its promises. Some of you are a little doubtful, thinking perchance that the whole idea is a plot to harm you.

Let us look at it from the standpoint of conditions as they line up today.

Thirteen years ago we reached the pinnacle of monopolistic glory.

In 1901, the spirit of monopoly contaminated the air. Rockefeller was on the verge of teaching us new economics.

The government was helpless; it only watched developments with alarm.

In 1901, Milwaukee common stock reached 190; New York Central mounted to 170; Northwestern 260, and New Haven about the same.

It had become the general notion that the world was full of money; that there was so much of it, that it could not command more than 3 per cent.

At this time, naturally, great promotions were made, and reckless financiering the vogue. There was nothing too great for the promoter.

Combinations running into millions and millions were formed, and the money was raised with greatest ease.

Men in New York practically lighted their cigars with ten dollar bills. Every New York office was full of men with schemes to make millions.

There was a terrible infatuation. The country had simply gone combination mad.

You could buy up a group of concerns for one million dollars; pay for them in stock and blossom out into a ten million dollar concern; and pay yourself a salary of $50,000 a year as long as the cash in the treasury of the underlying companies lasted.

Before President McKinley was assassinated, he realized the trend of the times. He scented danger, but he did not realize that he could do anything. So he personally appealed to J. P. Morgan.

He requested that he desist from the organization of United States Steel, but Morgan would not comply.

To his mind, every leading industry should be of monopolistic order. So he rushed in, in spite of the president's requests.

He knew that the country would digest the steel company in time. He thought the country was growing swiftly enough to handle the terrible inflations of Wall Street.

Well, he was wrong! Wall Street has never since enjoyed a boom or bull market.

Milwaukee has dropped from 190 to 102; New York Central has fallen from 170 to 90, and the whole world knows how hard up this Vanderbilt pet is. Northwestern has dropped from 260 to 133, and New Haven—that ideal monopoly so dear to the New England breast—has gone from 260 down, down, down to 76, and why it stops at that price, only a divine power can tell.

Down, down, down, have come all the great air castles of 1901. The great growing United States, so full of growing pains, has suffered terribly from indigestion ever since.

The first gun fired by the government was against the Northern Securities Co., a monopoly of railway traffic in the American Northwest. Strange to say, the shot went straight and the Northern Securities Co. was blown to pieces.

Other trust-busting tactics became successful, and then the world realized that the government really had the power to curb monstrosities, etc.

Then the panic of 1907 struck the country amidships. There never was such a terrible year as 1908.

President Taft did not let up. He fired broadsides in rapid succession.

Corporation managers were on the verge of suicide—and then came President Wilson, who said he would hang certain monopolistic interests as high as Haman.

Today, we stand at the low level of industrial activity as far as speculation and monopoly are concerned.

The sins of 1901 have been expatiated, and we are all alive.

The country has a wonderful vitality. It survived the operation—the patient is now ready to go back to work.

Corporation managers have realized their responsibilities; it took hard lessons to teach them.

Now in the 13 years of down hill life for great combinations, do not forget that American Telephone has not shared in the general indigestion.

No longer does anyone have the idea that money is only worth 3 per cent. No longer does anyone stand in the market place trying to loan his money on the borrower's terms. No longer will they jump into the stocks of great combinations. They are even reluctant to buy their mortgages.

So it has come to pass that American Telephone has bonded everything it really possesses. In other words, the family jewels are in the great American pawnshop.

As the Northern Securities was the first government victory, so is the telephone case the last.

The Bell telephone company would have fought this case to a standstill, but they saw the light.

First, they saw the force of public opinion in the prejudice against great combination, and the futility of trying to resist.

Second, they were tired of buying out competing plants. I don't believe they ever wanted to buy out a competitor. At least, I have heard that every time they bought a plant, it made the directors sick to see so much good money going to hostile pocketbooks, when friendly hands needed it so much.

Third, I believe they saw the end, if they persisted in their universally owned and controlled theory.

I believe they saw the lowering income, the increasing cost, and the increasing difficulty in financing a fight, and were ready for any surrender which involved no loss of honor.

Today American Telephone is earning but 6 per cent. on its physical property. You know that is a dangerous condition.

American Telephone needs friends, not enemies. Never was a concern so vulnerable, so sensitive to effective attack, and I believe they realize it.

I have always believed in locally owned and operated telephone companies.

When I began to have opportunity to look into the home life of so many telephone companies, I began to be amazed at the difference in the cost between the Independent and the Bell concerns.

Then I realized that universal, or monopoly, telephones were a double-edged sword, cutting two ways at the stockholders' pocketbook. And today, presto! local ownership is recognized as an economic factor, the condition of permanency, the road to profit.

Today there are very few men who can not see that universal ownership is not an economic thing, nor is it permanent. It is on the road to ruin.

You are recognized at the best time in financial history. The indigestion of 13 years is cured.

Instead of suffering for the sins of our fathers, you are going ahead and laying the foundation of health for your descendants.

You are recognized by the Bell company, by the public, by the banker and by the state. You are on the road to Wellville.

Put your house in order, you who have been so fortunate as to stay in the telephone business.

Put your house in the way of progress! Put away your musket and give full attention to your plow.

Your day is at hand!

This year we will see the end of the interlocking directorate.

There is no question of the mischief done by this interlocking scheme. It is particularly human to look after one's own interests. But the interlocking idea has not paid, simply because organizations, working under its banners, depend upon its fruits for what success they have.

It stands to reason that a great organization without initiative or incentive, or necessity, will go to sleep and ruin its owners by its unproductiveness.

In our own lives, we have the example of the Bell factory. By all means, the Bell company has a right to have a factory, if it confines its efforts to its own immediate needs.

But they play the dog-in-the-manger act. They reach out into the field of others and, by this interlocking hook and crook, they are trying to ruin others.

The whole idea is outrageous. It is positively un-American, cowardly and unworthy of the minds behind the plan.

If the Bell company means to do the right thing, it will not hesitate long to begin action. If it is sincere, it will abandon discrimination, as well as to quit buying telephone plants.

If it is sincere, and if it really recognizes its own 6 per cent. infirmity, it will abolish the interlocking factory situation, and either throw open the licensee field or withdraw the Bell factory from the field under the present conditions.

Today we stand at the very bottom of the scale, as far as monopolistic combinations are concerned. We are all going to begin an upward climb.

The concern, however, great and wealthy, that fails to heed the demand of today, will find itself a poor climber on the upgrade. It will find itself but a hollow shell, and all the world will know it.

We are all anxious to help out in the great telephone problem.

We all know that a third party stands by to take us over, if we exhaust ourselves in a foolish fight. That third party is government ownership.

It may be that there are men in control of American Telephone, who are blind enough to resist the upgrade impulse; but it scarcely seems possible that any man of ordinary intelligence could be a Bell director, and yet need a Daniel to interpret the handwriting on the wall.

It requires no Daniel to interpret the signs of the times, and woe unto him, or them, that stand in the way of the onrushing tide of a fair deal to all.

Woe unto the Bell company, if they do not follow out the spirit of that letter; and more woe if they do not voluntarily adjust the intolerable condition which exists in the manufacture and sale of telephone equipment.

I do not mean that you, or I, or the government, or a retributive agency will pour the vials of its wrath on the devoted head of the Bell company. I simply mean that if this cowardly, uneconomic condition is not nipped in the bud, it will work internal ruin.

No people or concern on earth has ever permanently survived on a predatory basis. Vengeance has ever been sure, as well as swift, and it always comes from the inside.

The celebrated James gang never really broke up until one of its members shot the leader in the back while he was hanging a picture.

I am very sure that if the Bell controlling interests thoroughly appreciated the situation, we could expect quick action. I wish I could believe that the cloistered gentlemen, who dictate these matters, would waken and remove the remaining irritation.

There is no dispute regarding the fact that the Bell company can not go it alone. They need help and lots of it.

No one expects the Bell company to give anything away.

Just take the dog away from the manger and let the oxen eat.

By all means do not starve the producers. Give them a chance to live and work.

MORAL: There are none so blind as those who will not see.

Working Out Details of Bell Company's Agreement.

N. C. Kingsbury, vice-president of the American Telephone & Telegraph Co., discussing the proposal of his company to grant the Independent companies the use of the Bell system's long distance toll lines, is quoted in New York Financial American as saying:

"No one seems to have any idea of the countless ramifications involved. I didn't myself when I made the toll service provision in my letter of negotiation. But since our operating force has taken up the work of determining the necessary new schedules of charges, this phase of the matter has presented itself to me very forcibly by the many questions—minute in detail but very essential to our plan—which have been put to me for decision."

In this connection Mr. Kingsbury mentioned that according to the agreement, toll line calls originating or finishing at Independent exchanges must be of a distance of more than 50 miles, and that, in addition to the regular Bell toll charge, Independent companies must pay an additional connection charge of 10 cents for each call. Other important features of this chapter of the agreement are that an Independent company may secure connection over the Bell toll system by supplying standard trunk lines between its exchanges and the toll board of the nearest exchange of the Bell operating company; that Bell operators shall establish the connection so far as is possible; that Bell exchanges shall always be used so far as is possible in completing a call by an Independent exchange; that the Bell system shall be permitted to use Independent lines in a reciprocal arrangement and that "long lines" business shall be accepted at the regular toll rate at any distance.

"Even the simple declaration that an extra charge of 10 cents will be asked for Independent calls over the Bell system presents surprising difficulties," said Mr. Kingsbury. "Our rates are air line rates. The matter of charge when the air line distance is perhaps six miles and the necessary wire connection over 50 miles, was recently brought to my attention by our operating force. This is only one of the countless details to be solved before the complete plan can be arrived at.

"In this connection it might be remarked that not so long ago the Interstate Commerce Commission wanted us to give the exact number of toll rates of the Bell system throughout the country. They were specific in their order and we figured that there were approximately 49,000,000,000 different rates in existence. Of course, there are many of these not used or seldom used, but they are all in existence. This might give some idea of the amount of detail involved in calculations having to do with rates.

"However, the work is being pushed and good progress is being made, but I would hesitate before venturing a guess as to when the plan will be ready for submittal to the Independent companies. If I said 30 days and the work were not completed by that time, undue criticism might result.

"I have received several letters from Independent companies asking for further details and for an idea as to the date when the proposal will be ready. I have not received any letters of criticism or complaint of our plan. The company, of course, is not asking or receiving suggestions from other companies. This is our own plan, and we are relegating to ourselves the right to frame it.

"Every effort will be made to work in harmony with the Independent companies. Our attitude is friendly, and we believe the other companies appreciate this fact, and will meet us half way. The assertion that the telephone users of a certain state would be compelled to pay a $1,000,000 annual increase as the result of our proposed additional toll charge was recently brought to my attention. The utter ridiculousness of the statement can be shown when it is considered that for such an increase to be created it would be necessary that at least 10,000,000 long distance calls be made. I can wager that that state does not make over 5,000 long distance calls a year. This is an evidence of popular misconception sometimes shown in matters pertaining to the telephone system.

"In fact, long distance calls are not half so numerous as they are commonly supposed to be. The long distance business of the American Telephone & Telegraph Co. amounts to probably only $10,000,000 a year. Another point that is generally overlooked is that the Bell system controls only 5,000 exchanges as compared to 20,000 of Independent companies."

Telephone Extensions in Edmonton, Canada.

The Edmonton, Alta., Canada, municipal automatic telephone system has been making rapid strides during the year 1913, as will be seen by the statement appended, says a writer in the Electrical News.

The first eleven months show an increase of 2,826 telephones over the previous year. The revenue for the year 1912 was $100,773, while the estimated revenue for the year ending December 31, 1913, is $195,000. The capital invested in the telephone department in 1912 was $862,074, for 1913 it will be approximately $1,800,000. Work is at present in progress on the laying of 11,100 miles of underground cable pairs, and it is expected that this will be completed in February.

This big program of work is the largest ever undertaken in the history of the telephone department and, when completed, there will be sufficient main feeder cables laid to take care of the districts of Norwood, Parkdale, Cromdale, Fairview, Woodland, that portion of Delton south of Delesare avenue, Eastwood, Mount Lawn, Santa Rosa, North Edmonton, Bellevue, Highlands and Virginia Park. The territory lying between Churchill avenue and the C. N. R. tracks and the eastern portion of Glenora have also been amply provided for. These extensions are being made with a view to taking care, not only of the present needs of the department, but also of forming a part of the legitimate telephone plant of the city when it has reached a population of from 150,000 to 200,000.

There has recently been completed in the switchboard department a 500-line addition in the north exchange, making a total of 1,500 lines now available in this building. It is expected that by February, there will be 1,800 lines in this building. Early in March, 500 additional lines will be ready for use in the main exchange and this will make a total of 5,500 in this building. With all these lines installed and ready for service, there will be a total of 10,800, or enough, it is estimated, to take care of the growth of the department during the year 1914.

Meeting of Reno County, Kans., Independents.

Eight of the 10 Independent telephone companies of Reno county, Kansas, were represented at a recent meeting at Hutchinson, Kan., to discuss matters pertaining to an organization for Independent telephone men. One of the principal subjects for discussion was concentrated buying. By pooling their orders for supplies considerable money is saved annually and the present contracts of the companies soon expire. The representatives present also discussed matters which are to come up at a meeting which they are soon to hold with the utilities commission.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Begun in the August 16 Issue, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery, Metallic System and Later to Common Battery

By Paul Hamilton

One morning soon after the proprietor arrived at the exchange, Miss DeLand entered with a message that Mr. Rankin wished to see Mr. Barrows. It had been the custom for Mr. Rankin to come into the exchange at least once a week and talk with Mr. Barrows on general local topics. A request for the telephone man to come to the outer office was an innovation. The real estate man was found seated at his desk, smoking a black and much wrinkled stogie.

"Come in, Barrows, come in. I sent for you so we could have a little talk, just between us two," Mr. Rankin began. "I suppose you have heard something about the bill that passed to the third reading at the board meeting last night?"

"No, I haven't. In fact, I've been too busy to give much attention to politics lately."

"It ought to interest you, for it is an ordinance to allow the two farmer or rural telephone companies to establish service in town, and build an exchange. I thought perhaps you might think they were after you. That is not the case. So far as I know you are in good standing with the powers that be."

"I shouldn't have given the matter much thought, unless some one interested, approached me," Mr. Barrows stated, not being fully satisfied as to what the liveryman was leading up to. However, he was left in doubt for but a few moments.

"I guess I might as well begin at the beginning," said Mr Rankin. "About five years ago, the farmers, both east and west of here, built lines and hitched on their instruments. There are 20 of them on the west line, and 16 on the east. Without consulting me in the matter, they went before the board and asked permission to come into Craneville and build an exchange. I beat them to it, and they got nothing. Then they came to me and wanted to run the lines into the exchange. I made them a proposition to let them come in as regular subscribers, provided each one would take one share of stock, par value $100, at half that price.

"I didn't want their lines, but told them to go on just as they were and that they could manage the companies the same as they had. Of course, they balked, as I supposed they would, and there has been war between us ever since. They've tried, time after time, to get into town, but they are so evenly divided, politically, that both parties have kept them out, or rather I have, as it's an old score with me. I don't want to see them come in, but I am not fixed to fight them openly since I sold the exchange. They don't bear any grudge for what happened when I was in the business and I do consider-

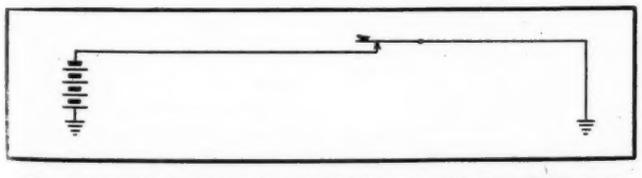


Fig. 47. Electrical Circuit with Battery as Source of Energy.

able business for them. If I butt in now, they would resent it."

"I see," mused Mr. Barrows, "but really, Mr. Rankin, I don't believe it would pay me to start a fight with them, for I don't think their movements will affect my business to any extent."

"I don't mean that, Barrows. I agree with you. They won't put enough money into their scheme to do you any harm. I'll do the fighting, if you'll put me wise; or that is, I'll have the bill changed enough so it won't pass, or if it does, it won't be what they want when they get it."

"How about the rate clause?"

"There's no chance there. They agree to a dollar a month. Here's a copy of the bill. Run through it and see if you can

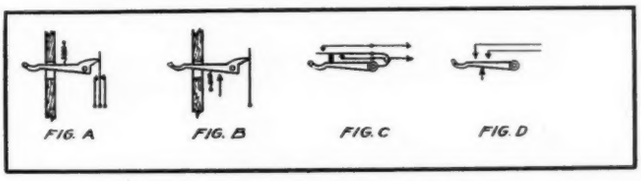


Fig. 48. Different Kinds of Switch Hooks.

suggest anything," Mr. Rankin requested, lighting his cigar and leaning back in his chair.

Mr. Barrows read the proposed legislative measure. When he had finished, he folded the paper and handed it back to Mr. Rankin.

"Mr. Rankin, I've been considering those farmer lines in a way, and hoped to have them connected to the exchange within another year. There appears to be a chance here of getting control of them. Suppose this bill should be amended with a time limit and penalty clause?"

"How would it sound? What kind of a noise would that make?"

"Well, suppose they were required to have 75 telephones in service within 60 or 90 days, with a penalty of $200 for failure to meet those requirements?"

"Then who would pay the $200?" queried Mr. Rankin.

"A bond would be required, signed by some responsible farmer."

"Well, we might make it a little stronger than that," chuckled the genial Rankin.

"No, I don't care to invest more than that, but an additional penalty of say two dollars a day for each day beyond the specified time, might be justifiable."

"Oh, I see! You figure on making the penalty good and taking over the property?"

"That was my idea."

"Well, there isn't going to be any pushing and crowding to get on that bond, even while the fire of enthusiasm burns so brightly. It can be managed, though. You think they can't meet the requirements?"

"Not without putting up more money than they are liable to want to."

"Well, Barrows, it's easier than I thought. I'll get hold of Tim Wilson and have him tack on that amendment. It's just an oversight on the part of the committee, you see.

"By the way," continued Rankin, "I bought that property down at Three Forks. I had an engineer down there last week on the *Q. T.* and his report satisfied me that your opinion was correct. It won't be long before you'll see some excitement among the electric light stockholders. I don't want to drive you away, but Kitty is having a 'go-round' with some one at the board, so maybe you'd better send her back here."

Mr. Barrows had also overheard the one-sided dialogue going on in the exchange, but had noted that Frank was the one with whom Kitty was having the trouble. However, he

returned to the exchange and Kitty came out to her desk shortly after.

Mr. Rankin's statement concerning the proposed power plant at Three Forks gave the telephone man something to think about. So far, the electric light company had not been pushing its construction work vigorously. Work had been done with such deliberation on the leads tributary to the main leads that Frank, Germany and the Doctor had been able to keep pace with the power men, transferring the telephone wires from the streets to the new pole lines in the alleys within the ten-day time limit fixed by the ordinance. This work was being done under the regular fixed expense.

At the rate the work was progressing, practically all but what might be termed main leads, would be cared for before the winter set in. It was the intention of Barrows to endeavor to maintain the heavy telephone leads until the following spring, when plans would be completed to replace some with cable and rebuild others.

The early development of Mr. Rankin's plan was open to two solutions. One was that the lighting company might rush its work to completion in preparation for fighting encroachments of a second company. The other was that construction work would be held up entirely, pending a reorganization, or compromise, and not be taken up again until spring.

The first proposition would make it necessary for Mr. Barrows to employ an additional construction force to avoid a penalty of $5 a day for not making the necessary transfer of the telephone wires within the required ten days.

As to the second proposition, the tributary lines which could not be transferred must be reinforced, even rebuilt in places, and much of the wire replaced to carry them through the winter, without greatly impairing the service.

In either case, there would be an expense which Mr. Barrows had hoped to avoid. It was now also necessary that he should give consideration to taking over the two rural lines, with the condition of which he was not thoroughly familiar.

These, with other matters, had taxed his nervous energy so severely during the day that, when evening came, he was far from being in his customary state of mind. Even though it was the regular evening set for the semi-weekly conference with his employes, he arrived at the exchange after the others had arrived. As he entered the door, he heard Germany's voice.

"What is this electricity already, Doctor?"

Evidently the Doctor had been relating some of the marvelous uses, in medical practice, of electricity.

"You might ask Mr. Barrows," replied the Doctor, "and if he can tell, he will be the one man of millions."

"We will not take up time discussing what electricity is," said Mr. Barrows. "Let us merely admit that it is an element necessary to the telephone business. If we become proficient in handling it to meet our needs, there will be time enough to sit down and attempt to solve the problem which has puzzled scientists since the world began. We will, however, seek a little diversion tonight and have a simple discussion of electricity as it is applied to telephone practice. Germany, there may be some other point which is not clear to you?" he concluded questioningly.

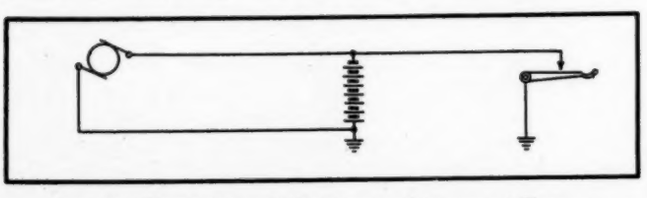


Fig. 49. Generator and Battery as Sources of Energy.

"Well, the Doctor has been talking resistance, volts, ohms and amperes, till my head rattles with them and I don't know where to put them."

"In the first place, let us go a step farther back. Let us get at the source or means by which the current is produced, or provided."

"That is the machine, like at the light works," spoke up Germany.

"Not always," replied Mr. Barrows. "We have two methods of generating current. One is by mechanical and the other by chemical action. The first applies to the machines you mention and the second to batteries such as dry cells, vitriol, etc. Then there is the combination of bath, the machine connected to storage cells or accumulators.

"The first, I think, you are familiar with from seeing the generators in the telephone sets and also the dynamo at the lighting plant.

"Where batteries supply the current the plan is like this (Fig. 47). You will notice that I have shown a key to open and close the circuit. I wish to impress this point upon your minds. When the circuit is completed to the poles of a battery, an action is set up in the chemical parts which sends current out. As long as the circuit is closed, this action continues and the electrical energy is soon exhausted. Batteries are therefore used on the open circuit plan."

"But we have no key at our telephones already," said Germany.

"You forget the switchhook."

"Oh yes! I know him now."

"Each of you get this idea thoroughly fixed in your mind. Be sure the batteries of the instrument are always connected so that the switchhook will open the circuit when the receiver is hung up. We are using a red braided wire for that very reason. By bringing one red wire direct to one of the upper contacts of the hook, no matter where the other may be connected, the circuit will be opened when the hook is down."

"Sometimes the hooks don't come clear down," remarked Frank.

"Then the trouble lies with the pivot, the spring, or the hook itself, and it must be rectified. The hook must work freely. By the way, there are many kinds of switchhooks and different principles are involved in each for opening the circuit. Here are some of them (Fig. 48). In general the hook and its contacts are represented in drawings like this (Fig. 48-*D*), with as many contacts as are necessary. But we are getting away from our subject.

"The third method I mentioned is like this (Fig. 49). In this case we have the machine cut in circuit with a battery of cells. The elements in the cells do not generate current. But when the machine is in operation, the action in the cells is such that the current accumulates in them and is stored there. When the machine stops, we have practically the same condition as with the dry cells. When the circuit leading to the hook or switch is closed, a part of the current from the machine flows through the equipment and the balance to the batteries.

"We now come to the first of the Doctor's technical terms, 'volts' or 'voltage', which means strength or pressure of the current. When we force water through a pipe, we say we use so many pounds pressure. In forcing electricity over a circuit, we say volts instead of pounds."

"You mean how fast it comes?" questioned Germany.

"No, not how fast, but how hard, or how forceful. Speed doesn't enter into the case. So far as we know regarding distances, we consider that the time required for electricity to travel from one point to another is too small to be calculated. It appears to be there waiting for us at the end of the circuit.

"It might be explained in this way (Fig. 50). Suppose we should lay a row of billiard balls on an inclined plane with a wedge under the last or lower one. Remove the block and they will roll off the plane."

"Mighty quick already," commented Germany.

"The instant we connect this wire with the battery (Fig.

50-*A*), it becomes saturated or charged. The space at the end of the wire serves the same as the wedge. By removing this space, that is, closing it by bringing the wires together, the current moves on around the circuit."

"By exerting sufficient force upon the ball at the top of the incline, the last ball could be forced over the obstruction," ob-

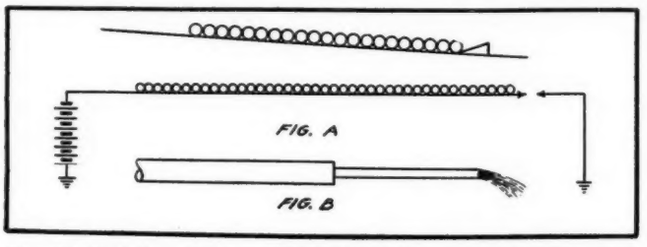


Fig. 50. Sketches Used to Illustrate Voltage and Current Flow.

served the Doctor. "Is that also true of the electrical case you illustrate?"

"Much big words!" ejaculated the jovial Germany.

"Yes," answered Mr. Barrows, "that is what is called arcing, from which the arc light derives its name. The current actually crosses an open space between the carbon pencils. It is on the same principle that I explained relative to our carbon protectors."

"Do we ever have to deal with such a case in telephone work? Our wiring is all closed, is it not?" the Doctor inquired.

"It is supposed to be, but we often find loose connections, which partially interrupt the flow of current and interfere with transmission. There are very few conditions in electrical practice that do not enter into telephony, but to dispose of another of your technical terms: The amount of current required or passing over a circuit is measured in 'amperes.' The number of amperes depends upon the relation of the voltage to the resistance or obstruction to the current flow in the path or circuit."

"You haven't said anything about ohms yet," Frank reminded Mr. Barrows as the latter began putting things to rights on his desk.

"There isn't much to say. We measure resistance by ohms."

"But this resistance? I don't see him," said Germany.

"It's like this (Fig. 50-*B*). Suppose we have a one-inch pipe carrying water. At a certain point we reduce the pipe to half-inch. We offer resistance to the flow of water. If we want the same amount of water to pass through the smaller pipe in the same length of time, we must increase our pressure.

"Take a wire the same way, and either reduce its size or substitute one made of lower conductivity; by increasing the voltage, you can overcome the resistance and keep the same current in the circuit," said Mr. Barrows as he finished clearing his desk.

(*To be continued.*)

Service Department of Telephone Association of America.

The Service Department committee of the Independent Telephone Association of America held two important conferences during the recent convention. Keen interest was shown in the work, which was gone over in detail and many ideas were suggested that will be of interest to the members. It was decided that bulletins shall be compiled, printed and distributed, monthly or semi-monthly, which will be non-technical and of interest to every operating company.

It was moved that special committees be appointed to submit subjects for bulletins, in regard to plant, traffic, commercial, legal and accounting questions. Seven representatives were delegated to submit topics in connection with local service, long distance, construction, equipment, matters. Interesting instances were cited where members of the service committee have furnished valuable advice to small companies, showing them where considerable time and money can be saved by standard methods being adopted in regard to construction, installation, proper maintenance of central office equipment, etc.

It was made evident that the Service Department is in a position to furnish much valuable information and act in a consulting capacity for all the Independent companies that are seeking advice or assistance of any nature.

Some of the subjects recommended by those appointed to take up the question of information for bulletins are:

COMMERCIAL.

How to increase your company's revenue by securing and retaining permanent and profitable patrons.

What are your present collection methods and how can they be improved upon?

How to inspire employes with loyalty for the good of the company and subscribers.

Why not educate the managers of small companies to devote more energy to the educational end of the telephone business?

CONSTRUCTION AND MAINTENANCE.

Proper installation and maintenance of switching exchange for villages and rural communities.

Proper maintenance of magneto exchanges, 50 to 1,000 lines.

Converting open wire plants to cable.

Maintenance of switchboard equipment.

Installation and maintenance central office equipment. Also proper installation and maintenance of switching exchange, 50 to 1,000 lines for village and rural communities.

Cross talk in small exchanges—how to eliminate it.

Soldered joints and use of sleeves.

General rights of telephone companies as to high tension crossings and proper methods of protection.

Proper maintenance of central station transmitters and local batteries.

Imprints of proper grounds for lighting protection.

Inspection and maintenance of cords and plugs.

Members of this committee in various sections of the country are now securing data and valuable information for the Service Department in order that it may be compiled and used in assisting all member companies who are having difficulties with which they are unable to cope.

The Service Department will have a representative in practically every section of the country. He will be familiar with conditions in that territory so when an inquiry is received, the Service Department will be in a position to secure the information, relative to the general operating conditions in that particular part of the country and thus handle all inquiries promptly and intelligently.

The service committee will hold a meeting at Chicago in about six weeks in order that matters of importance may be acted upon. The members of the service committee are: Chairman, W. S. Vivian, Chicago; secretary and manager, F. L. Eldridge, Chicago; R. L. Barry, St. Paul, Minn.; A. L. Staderman, Terre Haute, Ind.; H. L. Beyer, Grinnell, Iowa; Walter J. Uhl, Logansport, Ind.; C. Ewing, Buffalo, N. Y.; E. D. Glandon, Pittsfield, Ill.; John W. Coffey, Indianapolis, Ind.; J. M. Storkerson, La Crosse, Wis.; H. E. Bradley, Philadelphia, Pa.; W. C. Dillon, Corsicana, Tex.; J. B. Middleton, Portland, Ore.; F. V. Newman, Grand Rapids, Mich.; Hugh T. Wreaks, New York; Wm. A. Wynne, Raleigh, N. C.; and A. J. Shands, St. Louis, Mo.

The first bulletin will be ready to distribute at an early date.

An article under the title, "Standardization and More Revenue Available for Your Company," written by Manager Eldridge of the Service Department, has been published in pamphlet form. In this article the scope of the work of the Service Department is fully set forth. The various benefits, looking to more efficient operation of all departments of either large or small companies, which may be derived from membership in the association are specified and companies are requested to apply for information, relative to solving their problems, to the Service Department.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Oklahoma Supreme Court Refund Ruling.

The constitutionality of the act passed by the Oklahoma legislature on February 10, 1913, authorizing the Oklahoma Corporation Commission to collect and disburse to individuals entitled thereto any excess charges that may be found to have been collected by public service corporations, is upheld by the Oklahoma supreme court in affirming the action of the commission in regard to the refund demanded from the Pioneer Telephone & Telegraph Co.

The court holds that the Pioneer company is demanding and collecting a rate for its telephones in Oklahoma City in excess of that fixed by the corporation commission by its order of October 12, 1908, and must refund to its subscribers the excess, which amounts to approximately $62,000.

The order of October 12, 1908, provided that a telephone company should not increase its rates in Oklahoma without first making application to the commission, and submitting a schedule of the proposed changes for its approval. In July, 1909, the Burrows Oil Co., of Oklahoma City, filed complaint against the Pioneer under that order. The company contended that it acted under authority of a city ordinance and that the commission's order could not set aside its right under that ordinance. After a hearing, however, it was adjudged in contempt. The case was appealed to the supreme court, which, after several hearings, affirmed the commission's action.

Thereupon the state, through its attorneys, filed a petition with the commission, seeking to recover the amount of the excess charges alleged to have been collected, being at that time $60,357. The company contested the action but judgment was entered against it for the amount and the matter was again taken to the supreme court. The company did not question the correctness of the commission's figures but alleged that the action should not have been brought in the name of the state and that the act of February 10, 1913, was repugnant to both the state and federal constitutions.

Both contentions were decided against the company by the court, which declares that "if this conclusion is incorrect, the regulation of public service corporations provided for in the constitution in many instances would neither be adequate nor effective." The opinion was written by Justice Robert L. Williams, who was chairman of the committee on public service corporations in the constitutional convention and drafted many of the provisions of the Oklahoma constitution fixing the powers and duties of the corporation commission.

It is understood that the Pioneer will take the case into the federal courts, although no final announcement has yet been made in regard to that matter.

The corporation commission still has up for hearing the application of the Pioneer for a raise of rates from January 1, 1914. The company has given a supersedeas bond to guarantee payment of any excess charges from January 1 on, if its application for an increase in rates is not approved by the commission. The $62,000 excess covers the period from October, 1908, to January, 1914.

Burleson and Lewis Bills Will Not Be Considered.

The postoffice committee of the House at Washington has decided not to give Postmaster General Burleson a hearing on his plan for nationalization of the telephone lines. The postmaster general recently asserted that the telephone service could be operated in connection with the postoffice system at a saving of one-third to the patrons and that it would also prove quite profitable to the postoffice service.

Members of the postoffice committee notified Representative Lewis of Maryland, who is urging government ownership of the telephone lines, that they will not hear him on his bill for government acquisition of such lines until after the postoffice appropriation bill has passed the House. This spells defeat for the nationalization of telephone lines at the present session of congress.

Injunction Sought in Oregon Hotel Case.

The Pacific Telephone & Telegraph Co. has applied to the United States District Court at Portland, Ore., for a permanent injunction to prevent the Oregon Railroad Commission from enforcing its order in the Oregon hotel telephone case, in which the commission ruled that the Pacific company must grant an interchange service with the Home Telephone & Telegraph Co. in the Hotel Oregon.

Who Shall Pay for New York Appraisal?

Temporary delay has been experienced in the plans of the Public Service Commission of New York for appraisal and valuation of the property of the New York Telephone Co. in New York City. The question which arises is as to who shall pay for the appraisal, which will cost between $100,000 and $200,000. The New York Telephone Co. offered to advance $150,000 for the appraisal but this offer was rejected by the commission. The state comptroller has ruled that the state treasury cannot be drawn upon, even temporarily for any local scheme. The telephone property valuation must be statewide, he holds, if the treasury is concerned. Following this decision the commission entered into negotiations with the New York City government and Mayor Mitchell decided to bring the matter up before the board of estimate and apportionment.

Glen Telephone Co. Announces Rate Change.

The Glen Telephone Co., of Johnstown, N. Y., has announced that hereafter it will collect a toll charge of five cents for number to number connections between Johnstown and Gloversville, instead of the free service which has heretofore obtained, and will reduce its charge for extension telephones in business places from $12 to $6. The company hopes by the new arrangement to reduce operating expenses by eliminating unnecessary inter-city calls and to collect additional revenue from those using this service, in lieu of a general increase in rates in both cities, which, it is declared, would otherwse be necessary, as the company faces a condition requiring additional revenue.

Damage Suit Makes Co-operative Company Bankrupt.

In the United States court at Utica, N. Y., the firm of Mills & Mills, attorneys, has filed a petition in bankruptcy in behalf of the creditors of the Clarksville Telephone Co., of Clarksville, Albany county. The papers show liabilities of $19,190 and assets of $8,900. Among the liabilities is a judgment for $6,750 granted to Harry D. Allen, a lineman in the employ of the company who was injured when a pole on which he was working broke and carried him to the ground. He brought suit to recover $10,000 damages for personal injuries and a jury awarded him the amount named. The judgment was an important factor in bringing about the bankruptcy of the company Judge Ray at Utica named J. Harris Loucks, president

of the company, receiver. President Loucks has a judgment against the company for $4,000 secured a year ago for money advanced by him to the corporation. The outstanding obligations include bonds to the amount of $4,000, due on May 1.

The Clarksville Telephone Co. is a co-operative concern which serves about 160 subscribers in the towns of Berne, Westerlo, and New Scotland, Albany county. It has a working agreement with the New York Telephone Co. covering long distance calls. President Loucke said that the company's trouble was precipitated by the Allen judgment, although financial difficulties have been experienced for more than a year.

Annual Report of New York Commission.

The Public Service Commission of New York has made its seventh annual report to the state legislature. The commission first recommends several important amendments to the Public Service Commissions Law. Among these the commission urges that it be given authority, such as is now possessed by the Interstate Commerce Commission, to suspend for a period not exceeding four months, the taking effect of advanced rates pending investigation as to the reasonableness of the proposed advance. The commission refers particularly to the need of such additional power with respect to the proper regulation of railroad and street railroad corporations, telegraph and telephone, express, gas, and electrical corporations.

In reference to its telephone activities, the report states that the New York Telephone Co. has been acquiring the property but not the franchises of Independent competing companies. The commission recommends the amendment of subdivision 2, section 99 of the Public Service Commissions Law, in its application to telegraph and telephone corporations, so as to prohibit the acquisition by one company of the plant and property of another company without the written consent of the commission, as is now the case with respect to the acquisition of gas corporations and electrical corporations. In this connection the commission urges that its jurisdiction be extended to include all telegraph and telephone companies, whether possessed of more or less than $10,000 worth of property.

During the year the commission had inspections made of 265 telephone exchanges, rendering service to approximately 448,675 subscribers' stations. Upward of 778 recommendations have been submitted in inspection reports, and with few exceptions they have been accepted by the companies. Service observations are made by inspectors without the knowledge of the operators, to determine the average speed and accuracy of the service. The commission has on its records the names of 113 telephone corporations. There have been made to the commission 656 informal complaints as to telephone service in various sections of the state, of which 591 have been closed and 65 are now pending.

Injunction Refused at Birmingham, Ala.

Judge W. I. Grubb, of Birmingham, Ala., has denied a petition of the Southern Bell Telephone Co. for an injunction against the enforcement of the city ordinance of December 12, 1913, repealing a former ordinance providing for increased telephone rates in Birmingham.

To Vote on New Franchise at Ft. Dodge, Iowa.

If a new franchise ordinance, submitted by the Fort Dodge Telephone Co., of Ft. Dodge, Iowa, meets the approval of the voters at a special election ordered for Jan. 27, the company will pay into the city treasury 1½ per cent. of its net annual earnings. The franchise ordinance submitted allows the company to make slight increases in the rates it put in effect some time ago. The rates were the object of an injunction secured against it by the city, but the injunction later was modified so the company can take the money under the rate card if patrons want to pay, but can not take out telephones of those who refuse to pay the rates.

The company now is operating under a franchise granted in 1898 that fixes a residence rate of $1 a month and a business telephone rate of $2 a month. For several years, however, single party line service has been charged for at a higher rate. The company recently completely rehabilitated its equipment. It also built its own fireproof and dampproof building. The capital stock is about $175,000.

One of the features of the franchise ordinance, the adoption of which will be voted on at the special election, is the provision for a change in the rates every five years if necessary. An average of the rates charged in five Iowa cities larger than Fort Dodge and five Iowa points smaller will govern. At no time, the ordinance specifies, shall the rates be more than enough to bring in a reasonable return on the money actually invested.

Doctors Must Pay Business Rate in Montreal.

As the result of a recent hearing at Montreal, Que., Canada, on complaint of certain physicians against the Bell Telephone Co. of Canada, the Quebec Railway Commission has upheld the telephone company in its proposed increase in the telephone rate for physicians from $40 to the regular business rate of $55. The doctors argued that they did not use the telephone as much as business men and were therefore entitled to a lower rate. The commission, however, found against them.

Suit Over Penalty Charge in Michigan.

A temporary injunction has been granted to restrain the Union Telephone Co., of Owosso, Mich., from collecting a penalty in excess of the franchise rate in cases in which the telephone bills are not paid by the 15th of the month. The injunction holds during the pendency of a suit brought by the city of Owosso for a permanent injunction. The case is in the nature of a test case and probably will go to the state supreme court.

Michigan Attorney General Upholds Advance Charge.

Attorney General Fellows, of Michigan, holds that the Michigan State Telephone Co. has the right to charge three months' rent in advance. The attorney general says: "A public utility corporation of the character in question may legally require an advance payment by way of rental and three months is not an unreasonable advance." A similar view was held by the Michigan Railroad Commission some time ago.

Michigan Bell Company Gets Chicago Expert.

The Michigan State Telephone Co. has secured the services of W. J. Hagenah, of Chicago, who eight or ten years ago was the rate expert of the Wisconsin Railway Commission, to present its side of the case in the hearing before the Michigan Railroad Commission as to metered service in Detroit.

Lincoln Company Sells Crete, Neb., Exchange.

As a result of a long series of negotiations the Lincoln Telephone & Telegraph Co., of Lincoln, Neb., recently transferred its Crete exchange to the Crete Telephone Co., a local concern. The purchase price was $32,870, the amount paid by the Lincoln company to the Bell when it bought out the latter at Crete.

Status of Mutual Companies in Nebraska.

The attorney general of Nebraska has informed the Nebraska Railway Commission that the state laws disclose

nothing which would give the commission authority to order a mutual telephone company to extend its lines upon application of its prospective patrons. The question was raised by the Archer Telephone Co., of Merrick County, a mutual company which is not a common carrier or public service corporation, though its lines occupy the public highways of the state.

Indianapolis Intervenes in Central Union Rate Petition.

The city of Indianapolis has now filed with the Indiana Public Service Commission a petition to intervene in the appeal of the Central Union Telephone Co. for an increase of rates. The city's petition refers to the activity of the Bell company in absorbing Independent companies in violation of the Sherman anti-trust law. It asks for rates based on physical valuation and sets out that interests foreign to Indianapolis and Indiana are using much of the profits of the local company thus giving basis for a statement by the company that its rates are not giving a return on the investment.

It is set out that the Bell company is forced to buy material and equipment from the Western Electric Co. at exorbitant prices, which keeps down profits. It also is asserted that the American Telephone & Telegraph Co. dictates what the local company shall receive from toll business. It is charged that in the installation of the local switchboard in 1906, the Western Electric Co. was paid $25,000 in excess of a fair market price. No merger should be permitted, the city declares, unless the local company is divorced from outside control and made strictly an Indiana company.

Indiana Commission Swamped With Telephone Questions.

The fact is becoming apparent that the Public Service Commission of Indiana has more than it can take care of in the many petitions up for consideration before the body. Those who have cases before the body have visions of waiting two and three years for action. Among the number of complaints and applications filed, the majority have involved telephone questions.

Louisville Ordinance As to Party Line Service.

An ordinance has been introduced into the city council of Louisville, Ky., to give the Home Telephone Co. permission to use party lines in exchange for a $5,000 payment to the city. The ordinance was referred to the revision committee. At a recent conference the officials of the Home company declared that the payment of such a sum would be a hardship on the company.

Summary of State Commission Hearings and Rulings.

ALABAMA.

January: Hearing on petition of Postal Telegraph-Cable Co. charging the Southern Bell Telephone Co. with discrimination in favor of the Western Union Telegraph Co.

CALIFORNIA.

January 4: Decision requiring the Fowler Independent Telephone Co., of Fowler, Calif., to charge the same rates to all users whether stockholders or not, and fixing rates for the different lines of the company.

January 7: Hearing at Redlands on application of Southwestern Home Telephone Co. to issue $25,000 of stock and $100,000 of notes and some bonds to make extensions to its system.

January 15: Application by Joaquin Valley Farm Lands Co. and Louis Evans for permission to sell its telephone lines and system in Fresno county, in the vicinity of Tranquility and San Joaquin, to the San Joaquin Valley Telephone Co. The latter company has applied to the commission for permission to issue $10,000 capital stock, of which $7,500 is to be used to pay for the new lines, and the remainder to pay for improvements and extensions to its systems.

Decision No. 1132: Granting to the McFarland Telephone Co., with certain conditions, a certificate of public convenience and necessity to construct and operate a telephone exchange in the town of McFarland and adjacent territory and providing a schedule of rates.

INDIANA.

Date not fixed: Hearing on petition of 150 Indianapolis citizens for a merger of Bell and Independent systems.

KANSAS.

January: Hearing at Ottawa on complaint of Prof. O. S. Groner, of Ottawa University, regarding the Ottawa service of the Kansas City Long Distance Telephone Co.

LOUISIANA.

January 27: Hearing on a petition by J. R. Parker and J. D. Nix of New Orleans, against the Cumberland Telephone & Telegraph Co. for the establishment of a two-minute rate as well as the three-minute rate now in force; the re-establishment of long distance and cable rates in effect prior to 1906, including half rate for night and cable messages; and an order compelling the telephone company to give the name of the person to whom telephone conversations were directed in rendering their bills.

MARYLAND.

January 8: Order authorizing the Chesapeake & Potomac Telephone Co. to take over the Rock Creek & Marley Telephone Co. of Anne Arundel county.

MICHIGAN.

January 27: Hearing on petition of Union Home Telephone Co. to build a toll line from Linden to Manton, Mich.

January 28: Hearing at Detroit on the petition of the Michigan State Telephone Co. to establish metered service in Detroit.

MINNESOTA.

January 10: Order authorizing the Wauneta Telephone Co. to issue $1,709 of stock in denomination of $10, the proceeds to be used for the purchase of a central exchange building and for the construction of a system in Wauneta.

MISSOURI.

January 28: Hearing reset from December 27 in three cases against the Missouri & Kansas Telephone Co., by Dunlap, Lester and Atkinson, respectively, in complaints against increased rates at Independence, Mo.

NEBRASKA.

January 8: Dismissal of complaint of Percy Gardner against the Archer Telephone Co. to require the granting of service. The commission held that it had no jurisdiction as the defendant is a mutual company.

NEW YORK.

January 14: Formal order prescribing a 10 per cent reduction in the form of discount, on all bills covering subscribers' message rates for local exchange service in New York city under standard tariff contracts. Also order consolidating various pending telephone rate cases in New York City under the following title: "In the matter of the investigation of rates and charges to the public by the New York Telephone Co., for telephone service rendered within the city of New York."

January 23: Hearing at Buffalo by Commissioner Hodson on complaint of the Hamburg Business Men's Club against the New York Telephone Co. and the Federal Telephone & Telegraph Co. in the matter of rates between Buffalo and the village of Hamburg.

January 24: Extension of time to this date to enable the New York Telephone Co. to comply with the order of the commission of December 24 in the New York city telephone rate cases.

OHIO.

January 14: Order authorizing physical connection between the Citizens Independent Telephone Co. of New Lexington and the Rush Creek Telephone Co., of Junction City.

OKLAHOMA.

Order No. 770, Cause No. 1490: Findings of fact, opinion and order in the case of James W. Bolen vs. the Pioneer Telephone & Telegraph Co. for a reduction of rates at Ada.

SOUTH CAROLINA.

January 5: Order authorizing increase in rates of the Southern Bell Telephone & Telegraph Co. at Anderson to take effect 30 days after contemplated improvements to the system to cost $85,000.

January 9: Order authorizing the Laurens Telephone Co. of Laurens, S. C., to increase rates after the installation of metallic circuits and after the commission has passed on the efficiency of the service.

January 16: Denial of application of the Eagle, Wis., Telephone Co. for physical connection with the State Long Distance Telephone Co., through Elkhorn, Wis.

WISCONSIN.

February 12: Hearing at Madison on the matter of fixing and establishing reasonable regulations, specifications and standards for telephone service in the state.

Experiments with Telephone Relays on International Lines

Tests Which Have Been Made of Relays by the German and British Telephone Departments on Various Lines Between the Two Countries—Description of Relays Used in Experiments—Reproduced from Electrical Engineering, London

The British and German telephone departments have been engaged in some extremely useful experiments with telephone relays. Trials have been made between London and Cologne through the Anglo-Belgian submarine cable, and incidentally also between London and Berlin. The line from London to Brussels through the cable is telephonically equivalent to 22 miles of standard cable, through which, of course, telephony is quite satisfactory. Extending the line to Cologne, however, increases the length to an equivalent of 30 miles of standard cable; London to Berlin is equivalent to a further 20 miles of standard cable. It was found that by inserting a telephone relay at Brussels, the speech between London and Cologne was equal to that through only 20 miles of standard cable, and that therefore, even between London and Berlin, speech could then be heard. The chief experiments were between London and Cologne, however, and it is believed that they are being continued.

Two types of relay were employed. The first one is the Brown relay—a later form of the ingenious telephone relay described by S. G. Brown before the Institution of Electrical Engineers two-and-a-half years ago.

In this newer type, known as the "G" pattern, the secondary contact is a microphone chamber containing carbon granules instead of the minute "conduction space" between a platinum point and disc used in the earliest pattern, and subsequently replaced by an iridium point and hard carbon plate in his relays for wireless telegraphy. In the elevation view, Fig. 1, *N* is a permanent magnet, on the pole pieces, *H*, on which are wound two coils carrying the current received from the line. A steel reed *P*, can be adjusted by the screw, *W*, and has the front of the microphone chamber, *M*, fixed to its upper end which faces the pole pieces of the permanent magnet, making an almost complete magnetic circuit with a very small air gap. The microphone chamber contains two carbon-faced electrodes, and is nearly filled with fine carbon granules. The tension of the reed is adjusted by the screw *W*, until the reed is on the point of dropping against the pole pieces, so that its elasticity is nearly balanced by the magnet pull. *S* is a stop screw to

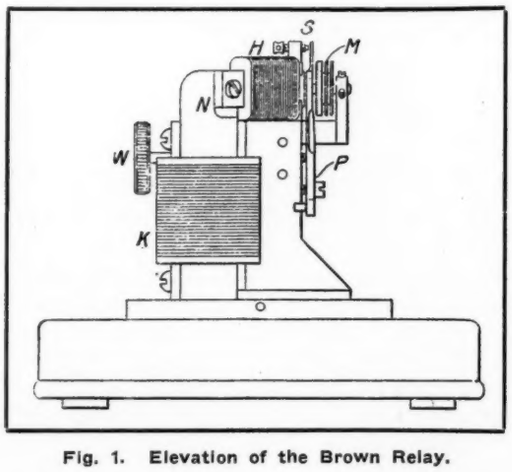


Fig. 1. Elevation of the Brown Relay.

prevent the reed from falling against the magnet faces, and *K* is a regulating winding in series with the microphone. It prevents any considerable drop in the steady current when the relay is strongly operated, and also, by its telephonic action, intensifies the magnifying power of the instrument.

The relay is used with a condenser in series on the primary side; and the circuit of the secondary side is made up by a battery, the primary of an induction coil, and the microphone chamber.

Mr. Brown states that the relay will magnify the current

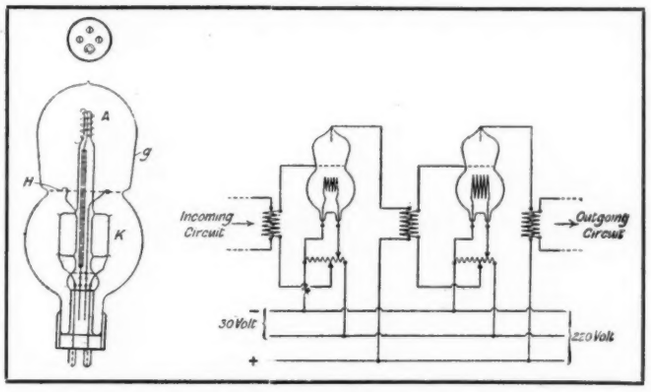


Fig. 2. The Lieben-Reisz Relay—Cascade Connection of Relays.

about 20 times, and that its use corresponds to a saving equivalent to the loss in 30 miles of standard cable.

If used in the middle of an ordinary simplex line, a relay has, of course, the disadvantage that it can only work in one direction, and in early experiments the line has been duplexed. There is, however, difficulty of maintaining good balance on a duplexed telephone line, owing to variations in insulation resistance, and varying terminal conditions, and duplexing, of course, also halves the transmitted and received currents. Mr. Brown, therefore, now uses a highly sensitive simplex automatic switch to reverse the relay connections according to the direction of the received speaking currents.

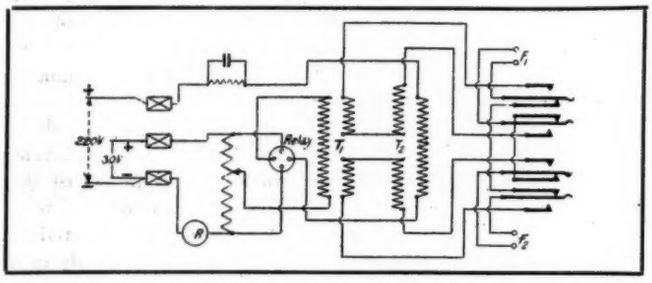
The second relay experimented with by the two postal administrations is the Lieben-Reisz relay, which acts on an entirely different principle.

The amplification of the waves of the telephonic current is in this case effected by passing the received current between two electrodes in a tube of mercury vapour, and by passing a high voltage current between the lower of these electrodes and an auxiliary one above both. This current has variations corresponding to those of the telephone currents, impressed upon it. The construction of the relay and the general connections is shown in Fig. 2. An increase in the magnitude of the impressed waves of about 30 times can be obtained, and by connecting two or more relays in cascade series, as shown in Fig. 2, the effects are multiplied.

The glass vessel *G*, is exhausted to a value of 0.001 mm. of mercury, and the anode *A*, has a large surface, as it consists of a specially wound aluminium wire 2 mm. in diameter, and *H* is the auxiliary electrode. The latter is made of aluminium, and has a number of uniformly spaced openings 3½ mm. in diameter. For the cathode, *K*, a glowing oxide cathode of Wehnelt pattern is employed, which here consists of a platinum wire wound in zig-zag fashion on a glass bearer, and overlaid with a thin layer of barium and calcium oxide. This is brought to a bright red heat of approximately 1,000° C. by a current of 1.8 amperes from a 30-volt battery. In order not to diminish further the discharging potential, which is reduced appreciably through the employment of the Wahnelt cathode, the space in the glass vessel is filled with mercury vapor at ap-

proximately 0.001 mm. pressure (the vapor pressure of mercury at 20° C.).

In order that the circuit of the current to be strengthened has the necessary auxiliary potential impressed upon it from the electrode *H*, the heating battery is connected to a high resistance potentiometer. The coil carrying the current to be



Fif. 3. Connection of Duplex Working Through a Single Relay.

strengthened is connected, either directly or through a transformer, in the conductor leading from the sliding contact to *H*. As a source of energy for the principal current circuit, direct current mains or a small battery of 200 to 250 volts are most suitable.

In order to choke the current fluctuations caused by the commutator of the machine, if the direct current mains are used, an impedance coil of about 3 henrys is connected in series with one pole and a condenser of 10 mf. between the poles. The circuit connections are shown in Fig. 3. The transformer T_2, is not necessary in theory, but it is used in practice to keep the 250-volt circuit from the connected apparatus. For the strengthened alternating currents, the impedance is reduced by a 2 mf. condenser.

With the right arrangement of the auxiliary potential, the bluish-green glows in the two parts of the lamp divided by the auxiliary electrode are equally bright, and the cathode dark space on the upper half of the perforated electrode measures about 4 mm. Adjustment of the auxiliary potential is provided for, and when correct the glow in the upper half of the lamp should be extinguished. The temperature of the Wehnelt cathode can also be adjusted by the resistance *R* (Fig. 3).

If the temperature is too low, the current in the gas, which normally should be 0.02 ampere, is not sufficient, and if too high the lamp burns unsteadily, thus necessitating a continuous regulation of the auxiliary potential. If this and the cathode temperature are adjusted correctly, the lamp will burn steadily for several hours. The relay should only be placed in rooms where the temperature is not above 35° C., as temperatures above this will raise the pressure of the mercury vapor so much that the negative potential of the auxiliary electrode does not suffice to keep down the flow of ions through the openings of the lattice, the cathode dark space, and consequently the resistance of the gas diminish and the working of the relay is prevented.

In Fig. 3 is shown a connection for duplex working. The relays are placed in the middle of the loop joining the two distant points. By using transformers of suitable design it is possible to connect lines of unequal length and of varying characteristics. F_1 and F_2 are the lines connecting the two subscribers.

Wisconsin Commission Calls Meeting on Service Standards

Invites 1,500 Telephone Companies to Conference at New Park Hotel, Madison, Wis., on February 12—Text of the Tentative Rules With the Commission's Comment Thereon as Formulated from the Official Record of the September Conference

The Wisconsin Railroad Commission has issued an order notifying the 1,500 telephone companies operating in the state that it will hold a hearing at 2 o'clock p. m. on February 12 at the New Park Hotel, in Madison, on the matter of fixing and establishing reasonable regulations, specifications and standards for telephone service in the state. A preliminary hearing on this subject was held on September 23 at which time a set of tentative rules and regulations regarding service was submitted to the telephone men, who suggested a number of changes. These changes, so far as the commission thought desirable, have been made and a revised copy of the standards will be sent to each telephone company in the state, together with the formal notice of hearing, the commission stating that it "believes that a further public hearing and investigation herein is necessary."

In publishing its revised standards the commission calls attention to the fact that the Wisconsin law requires that all public utilities furnish adequate service and invest the railroad commission with authority to formulate from time to time such standards and definitions of adequate service as it sees fit. The rules, it is declared, have been formulated to fit all exchanges in the state, from the largest to the smallest. The commission recommends that criticisms or suggestions be presented at the hearing or sent to the commission in writing promptly. The rules and published comment thereon, as embodied in the commission's circular, are as follows:

Line Construction.

Rule 1. The equipment and lines of each telephone utility shall be so constructed and maintained as to eliminate, as far as practicable, all cross-talk and objectionable noise on the line and to insure good transmission of messages over distances ordinarily made use of.

Where ground return lines are in service or where the lines are in close proximity to power lines, objectionable noise and poor transmission are frequently encountered. The tendency of present day construction is to eliminate these conditions and it is strongly recommended that the best types of construction and maintenance be adopted.

Rule 2. On new construction not more than 12 subscribers shall be connected to any one line having a length of 10 miles or less. On longer lines this number may be exceeded with the consent of the commission. Present lines having more than 12 subscribers connected shall be reported to the commission at once and reduced to 12 or less as promptly as possible.

It is expected that the number of subscribers on any one line will be reduced to a much lower minimum where the same is justified by the use of the service and the revenue derived therefrom.

Rule 3. Each telephone utility giving service between any two cities or villages should maintain at least one line for through traffic between these places, along which no subscribers' instruments are connected. Where the through traffic is heavy, additional lines shall be provided sufficient to maintain adequate service.

The above provision for through traffic between two exchanges or communities should be provided independent of whether such service is on a toll basis or is included in regular charges for service. In many sections of the state it will

be necessary to provide a large number of lines between cities or exchanges for through traffic.

Rule 4. Every telephone utility shall make such tests and inspections as may be necessary to insure that its lines, instruments and other equipment are maintained in condition for rendering adequate service.

The nature of these tests and inspections depends upon the kind of system, the protective devices installed and the interference from storms and other external sources usually experienced. Signaling equipment, switchboard cords and other equipment requiring frequent attention should be kept in first class order at all times. The commission does not desire to specify exactly the nature and extent of these tests, but its inspectors will criticize the practice of the companies in complying with this order and make suggestions relative to necessary changes in testing practice. When it is impossible to make permanent repairs very promptly, temporary repairs should be made. These, however, should be made permanent at the earliest possible time.

Central Office.

Rule 5. Each exchange shall have sufficient switchboard capacity and operating force to handle the traffic at all times with reasonable facility. Sufficient traffic studies shall be made by each utility to provide for necessary extensions and to demonstrate to the commission that sufficient equipment is in service.

Where the use of the service does not warrant having an operator on duty full 24 hours, provision should be made, if possible, for emergency calls being handled on a reasonable basis, even though the exchange is not operating for the ordinary convenience of occasional users.

The traffic studies should include such items as the number of calls made during the busy hour and during other periods of the day and night, together with the way in which this traffic is divided up between operators, the time of day when the heaviest loads occur, and whether or not this varies with the day of the week or month and with the seasons or weather conditions. In other words, the tests should be sufficient to show that the telephone company has the traffic conditions well in hand and has anticipated the needs for additional operators or switchboard capacity. These studies should also indicate the demand for trunk lines between exchanges.

Rule 6. Reasonable efforts shall be made by every telephone utility to provide for meeting all emergencies such as failure of lighting or power service, sudden increase in traffic, illness of operators, storms, fires and other emergencies which would seriously affect the service were these provisions not made.

One operator should not be left to run the exchange alone without having some one to call in emergencies. There should be some provision for changing over to another system of ringing as well as a reserve source for lighting which is instantly available. A reasonable stock of repair parts and line supplies should always be on hand.

Operating Force.

Rule 7. Any telephone exchange serving more than five hundred subscribers shall be considered as giving reasonably prompt service if 94 per cent. of the calls are answered in ten seconds or less. All other regular telephone exchanges should answer at least 90 per cent. of the calls within this period. Where the traffic is insufficient to require the entire attention of an operator, and the exchange is operated in connection with other work, slower service may be adequate. The operators should follow up calls with reasonable care and should disconnect the parties promptly after the calls are completed.

If an exchange is being operated in connection with some other work on the part of the operators, the commission may require the exchanges to be operated independently whenever the traffic and revenue warrant such change of operation.

Rule 8. Each telephone utility should adopt suitable rules and instructions covering the phraseology and methods to be employed by operators in handling regular and special calls.

In any line of work a systematic way of doing things has distinct advantage over the absence of such practice. In any line of work where speed, accuracy and reliability are of such vital importance as in the telephone field, it is necessary that a definite plan of operation be formulated. It is probable that operators should always repeat the numbers in order to eliminate, as far as possible, the giving of wrong numbers. Most companies already follow this practice, but a few who do not repeat the numbers are maintaining service which is reasonably free from wrong numbers. Telephone courtesy is extremely important to the growth and development of the telephone industry, the encouraging of the use of the telephone for important work and the eliminating of dissatisfaction and complaints on the part of subscribers. Not only is it necessary that employes of the telephone utilities are courteous over the telephone, but they should encourage courtesy on the part of all users. Employes should not be allowed to listen on telephone lines in use except where this is necessary in the carrying on of the work. In general, it is considered a punishable offense to violate the secrets of telephone communication which may be overheard. Operators should be very careful never to divert traffic from one subscriber to his competitors, or to discriminate in the quality of service and attention given to various subscribers. These matters are very important and violations will be dealt with vigorously by the commission whenever detected.

Information and Treatment of Subscribers.

Many complaints will be forestalled by furnishing subscribers with all the information they should have in order to utilize their telephone service easily and efficiently. The following rules should be of assistance along this line:

Rule 9. Telephone directories of exchanges serving over 1,500 subscribers shall be revised semi-annually; the directories of all other exchanges should be revised at least once each year; all directories should be dated.

The revising of directories should really be governed by the number of changes necessary to make the same correct and up to date. Where the changes are so few as to become practically negligible, a telephone company should apply for modification or exemption from this rule. In general, it will probably be necessary to revise directories as frequently as required in the rule, and in some instances it may be desirable to even make the revisions more often.

Rule 10. Every telephone utility should publish in its directory or otherwise all local rates in force together with such instructions as may be necessary to inform subscribers of the action they should take in order to obtain efficient and adequate telephone service from its system.

Utilities may find it convenient and desirable to include in their directories the commission's rules, cuts showing the proper way of speaking into the transmitter, suggestions regarding the annunciation to be followed to eliminate misunderstanding the numbers given. It is recommended that patrons be required to call by number as far as practicable.

Rule 11. Rules governing toll service together with rates to nearby exchanges shall be posted in all pay-stations and printed in all directories.

Rule 12. Every exchange shall maintain a record showing all complaints, interruptions or irregularities of the service, which shall include the date and time the trouble is reported, the nature of each complaint or irregularity, the duration of the same and the action taken. All reasonable efforts should be made to eliminate interruptions or irregularities and to promptly take care of all those which arise.

Such a record of complaints will indicate to the company officials and to the commission's inspectors whether or not

any particular subscriber encounters the same difficulty frequently, when a large number of complaints arise from the same irregularity in service and whether some phases of the maintenance or operation are unsatisfactory. The ordinary slips filled out when the complaint is made, together with the notes of the trouble man or wire chief will be satisfactory. Subscribers should have definite instructions as to how and to whom they should report difficulties. The one to whom complaints should be made should be easily accessible and should have time to follow up these complaints and authority to properly correct irregularities which exist. All employes should be encouraged to report complaints, irregularities and criticisms whenever these are received either directly or indirctly whether on duty or not. A record showing but few complaints does not always indicate satisfactory service. Patrons should be encouraged to report trouble and when the complaints are received, sufficient questions should be asked of the complainant to record definitely what trouble he has experienced. The co-operation of all patrons should be solicited and such matters as prohibit the trimming of trees, the monopolizing of party lines or other difficulties which might be reduced by co-operation on the part of the public might well be presented.

Rule 13. In order to facilitate the enforcing of these standards, each telephone utilitv shall file with the commission the name and address of the official or employe with whom service complaints and irregularities shall be taken up in order to insure prompt and careful attention to the trouble so reported. Each utility shall also file with the commission a map of its system and keep a similar map at their principal office, revised and up to date. The commission shall also be kept supplied with each edition of the directory as issued.

TOLL SERVICE.

Toll service should be properly routed to give most efficient service as well as justice to the telephone companies where more than one utility is involved. In general, toll circuits should be tested out early each morning in order that trouble may be promptly eliminated. This is particularly important after storms. On joint lines or when one utility uses the lines of another utility, trouble on circuits should be promptly reported to the utility responsible for the maintenance of the line. Accurate and convenient timing devices should be installed in order that toll charges may be just, and that the service may not be unnecessarily delayed in order that the calls may be properly timed. The tone of voice used by operators is very important, particularly on toll service. Toll operators should cultivate not only a distinct articulation, but low tones and pleasing voice. This would aid materially in giving satisfactory service at highest efficiency. A record of the condition of long distance circuit entering each exchange should be maintained for the convenience of the utilities in properly maintaining their lines, and for the commission's inspectors in investigating service conditions over toll lines.

Annual Meeting of Western Red Cedar Association.

The regular annual meeting of the Western Red Cedar Association was held in Spokane, January 12, 1914, with all members, except one, represented. The minutes of the previous meeting were read and approved, after which President Culver presented his annual address, which was, in part, as follows:

This association is the successor of the Idaho Cedarmen's Association, which was organized January 3, 1906, by three cedar dealers who are still members. At our annual meeting in 1913, the present title of our association was adopted, that the name might me more representative of the district in which our products originate.

During the first half of the year, poles, posts and piling moved freely at fair prices. A general recession of trade during the latter half of the year has taken place. Your president believes, however, that very shortly a more healthy condition of affairs will prevail.

Stocks are not overly large and fairly well assorted; it is expected the output during the present winter will be greatly restricted. Owing thus far to lack of snow, practically no stock has been hauled out. In addition, owing to the poor market in the latter part of the year, the usual preparations for cedar production were not undertaken. Another factor tending toward curtailment is the lack of activity by the sawmill companies, which annually produce considerable cedar they find mixed in with their saw timber. It is understood cedar dealers in Michigan, Wisconsin, and Minnesota are suffering from somewhat similar climatic conditions: therefore, the general outlook at this time would indicate a lesser output than for several preceding years.

That we may bear in mind the extensive use of poles for conveying electricity, let me remind you that in the United States there are over 800,000 miles of pole lines, there being in service today over 32,000,000 poles. The annual renewal requirements are over 4,000,000, and of these large totals it is claimed over 65 per cent. are cedar.

We may have some confidence in predicting a fair movement of our commodity during the coming year, based upon the following:

Tariff and currency bills are generally satisfactory and out of the way. Some additional trust legislation will, no doubt, be enacted by the present Congress, and we are led to believe it will tend to clarify the government's position by defining limit in which large business can be conducted legally and without molestation. The general opinion is that Eastern railroads will soon be permitted to advance their freight rates five cents per hundred, thus enabling them to more readily market their securities and expend large sums for betterment.

Your president would urge upon the members the importance of shipping stock fully up to grade. Some of us are not always particular to have a competent inspector at the loading point. A good pole is a good advertisement: while a poor one may lose a customer and cause oceans of trouble.

The Forest Products Exposition will be held in Chicago, April 30 to May 9 inclusive, and in New York from May 21 to May 30. A display of Western cedar at these expositions would, no doubt, prove a great advantage to our industry.

A short discussion followed the reading of the address, in which C. P. Lindsley, of Lindsley Brothers' Co., spoke briefly on the importance of having an exhibit at the Forest Products Exposition. Mr. Lindsley stated that he had taken the liberty of reserving a space at the Exposition with the understanding that, if the Western Red Cedar Association did not care to have an exhibit, the Lindsley Brothers' Co. would.

The report of the secretary and treasurer was read, showing a substantial balance on hand in the treasury.

The committee on constitution and by-laws, consisting of W. M. Leavitt, of the National Pole Co.; E. A. Lindsley, of Lindsley Brothers' Co., and President Culver, as member ex-officio, reported that they had prepared a constitution and by-laws as ordered, which they presented. Various amendments were offered to the constitution and by-laws as presented, and after a lengthy discussion, they were adopted as amended.

The election of officers and directors was carried out as provided by the new constitution, and M. P. Flannery, vice-president of the association during 1913, was nominated for the office of president by C. P. Lindsley. The nomination was seconded by Mr. Chapin, who also moved that the nominations be closed, and Mr. Flannery be declared elected. This was carried unanimously and Mr. Flannery was declared elected by the chair.

W. M. Leavitt, Western manager of the National Pole Co., was nominated by E. T. Chapin and the nomination seconded by C. P. Lindsley, for the office of vice-president. Mr. Leavitt was elected unanimously.

R. G. Jones, of the Lost Creek Cedar Co., of Ione, Wash.; H. C. Culver, of the Sandpoint Lumber & Pole Co., and C. P. Lindsley, of Lindsley Brothers' Co., were nominated for directors of the association. Mr. Lindsley with-

drew in favor of E. T. Chapin, and Messrs. Jones, Culver and Chapin were duly elected as directors of the association for the year 1914.

As the new constitution provides that all committees shall be appointed by the board of directors, the meeting was adjourned to allow the directors to meet and select the committees. They later reported the following committees had been selected:

Pole committee: C. P. Lindsley, chairman, W. M. Leavitt and M. P. Flannery.

Post committee: Frank Culver, chairman, L. D. MacFarland and M. Stewart.

Piling committee: H. C. Culver, chairman, G. E. Merrill and E. T. Chapin.

Railroad committee: G. C. MacDonald, chairman, W. G. Chaney and L. H. Clark.

Forest Products Exposition committee: E. A. Lindsley, chairman, E. T. Chapin and W. M. Leavitt.

Inspection committee: C. P. Lindsley, chairman, Frank Culver and H. C. Culver.

The board of directors also reported that, in accordance with the provisions of the constitution, R. L. Bayne, of Lindsley Brothers' Co., had been elected as secretary and treasurer for the year 1914.

Meeting of St. Louis League of Electrical Interests.

The annual meeting of the St. Louis League of Electrical Interests, Jovian Chapter, was held at St. Louis, Mo., on January 20. Reigning Jupiter, W. N. Matthews, in the absence of President A. C. Einstein, called the meeting to order, immediately after the dinner. After a number of speeches, the members were entertained by the telephone moving picture film, "The Spinners of Speech," and with some amusing features arranged by the entertainment committee.

The following officers were elected: H. J. Pettengill, president of the Southwestern Telegraph & Telephone Co., president; Frank D. Beardslee, sales manager of the Union Electric Light & Power Co., first vice-president; F. B. Adam, vice-president and general manager of Frank Adam Electric Co., second vice-president; Fred B. Johnson, sales manager of Wagner Electric & Mfg. Co., secretary and treasurer.

Quarterly Earnings of Western Union.

The Western Union Telegraph Co. has issued a statement of estimated earnings for the quarter ended December 31, 1913, based upon completed figures for October and November and partial returns for December. The gross earnings, including income from loans and investments, is shown to be $11,932,200, and the total operating expenses, including rent of leased lines, current maintenance, depreciation and taxes $10,824,820, leaving a balance of $1,107,380. Deduction of interest on the bonded debt, amounting to $334,307 leaves estimated net profits available for dividends amounting to $773,073. The dividend paid on January 15, 1914, of three-fourths of one per cent. on the capital stock issued, amounts to approximately $748,073. This leaves the surplus earnings for the quarter $25,000.

Chardon, Ohio, Company's New Policy.

The Chardon Telephone Co., of Chardon, Ohio, recently issued circulars giving notice of a toll charge of 10 cents for conversations between Chardon and Burton or Middlefield, a service which was formerly given free. The company has also discontinued a system by which subscribers who paid yearly in advance were given a discount of 20 percent. All subscribers will hereafter be charged the regular rental of $15 per year. A monthly penalty of 10 cents will be levied for arrears. The company's circular says:

"With the increased cost of giving service the Chardon company cannot pay its stockholders 6 per cent. on their investment and lay aside a sufficient sum for rebuilding. Consequently, the heavy loss just sustained by the company due to the storm has compelled it to discontinue its dividend and borrow heavily to provide a sufficient sum for building."

German Device for Testing Lightining Arrester Grounds.

The accompanying illustration shows one form of German instrument utilizing the telephone bridge for making tests of lightning arresters. This instrument is used for

Instrument for Measuring Resistance of Arrester Grounds.

measuring the electrical resistance of liquids, or underground conductors placed in wet soil, such as lightning arrester connections.

The measurement is made, as in the balance scale by comparing the resistance to be measured with a standard resistance in the instrument. For instance, on the beam, the standard weight is shifted until the pointer on the graduated arm is at zero and balances. In the same manner, the standard resistance is shifted on a measuring wire until the index shows zero, which is indicated by listening in the telephone receiver. When the zero point is reached, the least sound is heard, or no sound at all.

The apparatus consists of two separate parts, including a box with the battery, induction coil and interrupter, which produces a pulsatory or alternating current, and the telephone bridge proper, which includes the telephone receiver, flexible cord and connections. Very accurate results are obtained with this convenient and simple device.

Various forms of this apparatus have been made, varying in weight from 1.3 kilograms for the small pocket size, to 5.5 kilograms for the more elaborate instruments, and measuring from 0 to 200 ohms. The telephone bridge of Nippoldt only weights .5 kilograms and measures resistances from .1 ohm to 1,000 ohms.

A Successful Canadian Rural Line.

One of the most successful and prosperous rural telephone companies in Ontario, Canada, is the Ayr Rural Telephone Co., of Ayr, Ont. Its finances are in excellent condition, the company having a capital of $7,000 and a reserve fund of more than $2,000. It paid a dividend last year of 10 per cent. and gave every subscriber a rebate of $1.50. There are more than 140 subscribers. The board of directors consists of Messrs. A. E. Watson, W. A. Ramsay, Reeve Woolner, Wm. Manson, J. A. Manson, and D. H. Lilloco.

Practical Subjects—Letters and Discussions

Letters from a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:

It is an old saying that there is a hole in every man's armor. They have been a long time getting Doc's goat but I guess they've got it finally. For a while I thought the Pomeranian cat joke would cure him of getting caught again, but it didn't.

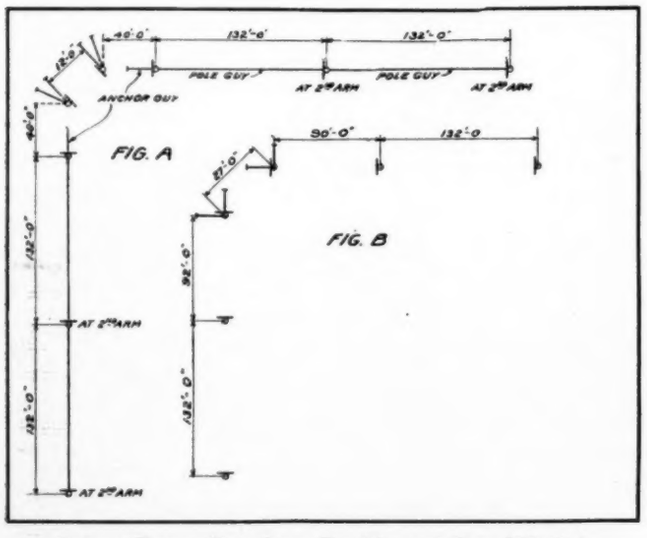
It is surprising how easily they can get around the old man now. It is a tale-bearer's game they worked. The main investigators don't talk to Doc direct, but instruct someone to say to him: "Bill Sykes says so and so," "Jack Downey told me such and such a thing," and to keep it up until the game gets on Doc's nerves so strong that he walks right into the pit they have dug for him.

The latest is considerably more than a joke to my way of thinking. I told you that the folks in Podunk want a telephone system, but they want it for a dollar a month. I talked Doc out of that and Skinner helped a lot to hold him back by arguing with him that it could be done for a dollar. About two months ago, it began to be noised around, so Doc could hear it, that nearly every outspoken advocate of the plan had expressed his views plainly but in practically the same terms, "A telephone man might do it for a dollar a month, but Doc Stuver never can." No one said that to Doc first-handed, but always mentioned a third person as saying it.

Doc finally broke loose. "I'll show these yaps and I'll do it with my own money," he told me. There was no way out for me but to superintend the construction work for him. The fellows who were willing to subscribe for stock are tickled to death to keep their money out of it. One thing, they had better be prepared to come down with their dollars cheerfully and in advance. Doc says it isn't a case of making "it" pay, but of making "them" pay.

The line inspector was out the other day—came out on a special job and I drove him out to where he wanted to go.

There is a corner up the line about five miles that I have



Corner Turns—One Gave Trouble and One Did Not.

been watching. It attracted my attention almost the first time I went over the line. I noticed that there had been slack cut into almost every wire and the wires in the corner and two adjoining spans have always been as tight as fiddle strings. I had one case of trouble there on account of a pin breaking. It seems there have been enough breaks in that spot to attract attention, and the inspector was sent out to see what could be done. The corner was like this (Fig. A). The thermometer had been up around 94 degrees for several weeks. The inspector said that if there was ever going to be any slack at this corner we ought to find it on this trip. But we didn't find any in the corner span, and not over a couple of inches sag in the two short adjacent spans. The next two spans showed about 18 inches sag and beyond that the wires hung in festoons from 24 to 30 inches.

He told me the corner had been worked on every year for five years. Sometimes the slack was worked to the corner from both directions. Other times slack had been cut in the corner span. Dead end, on figures 8, ties had been used, without success. Every winter the pins and wires kept breaking at this point.

I suggested that we look at the wires at the next right angle corner, a half mile up the line. We found this corner in good shape, with the proper amount of slack in the corner span. However, the construction was entirely different. We decided that this might be the key to the situation. It was built like this (Fig. B). There was so little difference in the lay of the ground at the two corners that we were at a loss to know why the construction work was so different. But you know in the old days, we sometimes did unusual things to get rid of poles.

Well, we spent more than one hour at the bad corner discussing the problem of doing the right thing with it. I even went up and worked back some slack on two wires that apparently were about to break the pins.

The inspector claimed that the corner was not badly built; that it really answered all the requirements of the specifications, that is, all the important ones. I asked him about the 40-foot spans. He said the specifications did not cover that in detail, but it was generally understood that the spans on each side of a corner span should be approximately three times the length of the corner span to hold back the slack. It was the first explanation I ever heard as to why these spans are generally made shorter than the regular spans. One can easily understand that the weight of 132 feet of wire, pulling direct on 12 feet or even 27 feet would always take the slack out of the corner span. A span a third shorter would ease the strain.

The inspector went up the poles with me and we examined each tie. Not more than two or three were "pulled," showing that the slack had run through them.

In the course of our talk, I found out that he was a college man. He said to me: "Now, Dick (they all call me Dick), you've probably helped build more lines than I ever saw. In fact I've really had no experience in the practical branch of the work. Tell me, did you ever see a case of this kind?"

Of course I have seen corners built in every way similar to this one on account of right-of-way difficulties, trees, embankments, etc., but never had an opportunity to see what the after results were. I suggested double arms for the corner poles, but he explained that, in his opinion, they would not overcome the effects of expansion, contraction, and gravitation.

Then we considered rebuilding the corner, and lengthening the short span to 25 or 30 feet, but after he had estimated the cost, he shook his head.

"We've got to find a cheaper method than that," he said, and got out his specification book and looked it through carefully. When he came to the place where there was a diagram of an old style transposition dead end, he stopped turning the leaves, and began studying the line again. Then after making a few figures, he said:

"Dick, they'll have to stand for it. I'm going to try it out.

This isn't the only corner that needs attention, either."

Then he told me that he would send one of the regular linemen out with the material and, with what help I could give him the job wouldn't cost much.

The plan is to string in new wire around the corner and dead end it on transposition glass at the outside pole of the 40-ft. spans; also to dead end the line wires at this point and make a joint with a half sleeve between the two tails above the arm.

That will take practically all the strain off the corner poles, throwing it onto the line and anchor guys of the adjacent poles. Ding me! If I don't believe it would be a good plan on all heavy corners. We're going to do the job next week if the weather permits. I put in that provision because we have already picked two days and then it rained.

I know of several places where we had difficulty in getting guying rights, where a good strong pole would have carried 92 feet of wire without any guy at all, provided the dead end poles were securely guyed; at least a single anchor close to the pole would have done the trick. There may be some big drawback to such a scheme for general use, but from a practical standpoint I can't see it.

Tweedles isn't at all well, Ben. Doc can't make out what the matter is, although he talks encouragingly enough. Her worst symptoms, to me, is that she has "put away childish" things, so to speak, and acts twice as old as her years. She's not the rollicking, joyous child she was six months ago. She's our only little girl and the pride of our hearts.

Your Uncle Dick.

Prize Contest for New Stations a Success.

A very interesting and successful prize contest was recently conducted by the Temiskaming Telephone Co., Ltd., of New Liskeard, Ont., Canada, to increase the number of its subscribers. In explanation of the plan followed, the company writes:

On November 5 we sent notices to all operators and agents informing them that during the previous month this company had made the largest net gain in stations for several years, the gain being 40. This brought our total number of telephones in use up to 1,130. In the notice sent out, we stated our desire to reach a total of 1,200 before the end of 1913, and with this end in view we offered a prize of $15 to the agent or operator turning in the greatest number of contracts during the next six weeks. The competition was to close on December 16. We did considerable advertising during the contest and are pleased to report the contest was a great success, so much so that two weeks before the close of the contest we offered a second prize of $10 and a third prize of $5. The final result of the first five contestants was as follows: Mrs. C. W. Ross, night operator, New Liskeard, 27 contracts; Miss B. Thompson, head operator, New Liskeard, 27 contracts; Miss R. Adair, head operator, Haileybury, 21 contracts; Miss M. Bedard, operator, Cobalt, 17 contracts; Miss A. Lafrange, head operator, Cobalt, 13 contracts.

Altogether a total of 138 orders were received in six weeks, against these were 35 take-outs, leaving a net gain of over 100, which brings our total number of stations well over the 1,200 mark.

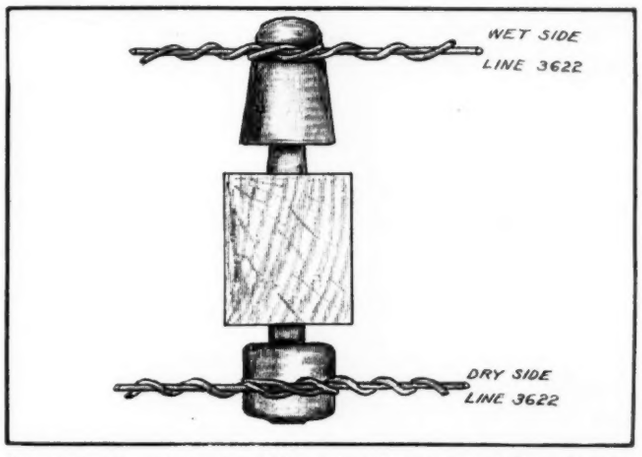
The directors were so well pleased with the result that they awarded two first prizes of $15 each, one second prize of $10 and two third prizes of $5 each.

The idea, we believe, is original, and was the suggestion of our solicitor, A. N. Morgan, New Liskeard.

Insulation of Lines in a Salt Fog Country.

I have had considerable trouble with the salt fogs which are prevalent along the coast. We have a line which is not over 250 feet from the water's edge and at high tide the salt air is very bad. It collects on the glass insulators, pins, arms and poles to such an extent that formerly all the lines went short every night and also during the fogs in the day time. The trouble would clear up, however, as soon as the sun would come out. Methods which I have tried out to overcome the troubles have been described in TELEPHONY in issues of May 4, 1912, September 7, 1912, and October 30, 1913.

In the issue of September 7, 1912, I showed a sketch of a duplex pin which I intended to try out for the purpose



One Arrangement for Insulating Line Wires in Salt Fog Country.

of getting better insulation between the line wires. The accompanying sketch shows the arrangement of the pin on the cross arm and is the same as that in the September 7, 1912, issue of TELEPHONY, except the positions of the wet and dry sides of the line are reversed. In the former article I specified that the dry side of the line should be attached to the pony glass insulator and the wet side to the duplex insulator; but in doing so on this particular line of poles, I found by voltmeter tests that I had from 10 to 12 volts leakage on the duplex glass insulator and from 1 to 3 volts on the pony glass insulator.

We now have the wet side of the line on the pony glass insulator. I recommend this arrangement to all who use the duplex pins and insulators as a circuit of two duplex insulators, side by side, will have more trouble in it than one on two pony glass insulators directly above it, for the deep skirt makes the pony the better insulator, as the wet side of the line requires the best insulation obtainable. This method of insulating the lines has proven exceedingly satisfactory to us for the past 10 weeks.

C. E. Nicholas, Manager,
Redondo Beach, Cal. Redondo Home Telephone Co.

Profit Sharing Plan of Kansas Company.

The McPherson Telephone Co., of McPherson, Kan., has recently announced, through its board of directors, that at the end of the present year it will share profits with its employes by adding to their regular salary five per cent. This added money is not in recognition of special service and is not to be considered an increase in salary, but is a share of the profits that the employes are to have in the earnings of the company. The stock is owned by 68 residents of the community. J. E. Wright is president and L. C. Criner is manager of the company. The company owns copper metallic lines extending to Hillsboro, Little River, Inman, Buehler and Moundridge.

Telephone Business Increased by Advertising Talks.

Manager W. E. Hutchens of the United Telephone Co., of Hartford City, Ind., attributes his success in adding much new business the last year, to advertising. He has run a series of telephone talks in the local papers. They have covered various phases of service, the uses to which it could be put, and the desire of the company to remedy all complaints.

Oklahoma Valuation Decision Criticizes Bell Methods

Decision of Oklahoma Corporation Commission in Case Involving Rates of the Pioneer Telephone & Telegraph Co. at Ada Contrasts Valuation Methods of Commission and Company Engineers and Declares Fallacies of Latter—Summary of, and Excerpts from, Commission's Findings

In the December 20th issue of TELEPHONY there was published a brief report of the final order of the Oklahoma Corporation Commission reducing rates in the telephone case from Ada, which was brought by James W. Bolen. This decision followed a careful analysis of the valuation of the property of the defendant, the Pioneer (Bell) Telephone & Telegraph Co., at Ada. A wide discrepancy was found to exist between the valuation placed upon the property by the engineers of the corporation commission and the engineers of the defendant company, the difference being in the following factors: Proportion of toll plant to be included; right of way; rental or ownership of transmitters and receivers, depreciation, casualty insurance during construction, going value.

The commission's engineer, George P. Player, found the value of the defendant company at Ada, including the portion of the defendant's toll plant chargeable to Ada in his opinion, as $63,869, while the defendant company's engineer fixed a value on the Ada exchange plant, excluding the toll investment, which he regarded as not related to operations in the city of Ada as involved in this case, to be $33,828. Both valuations are without deductions for depreciation.

The commission explains that the purpose of its expert and engineer, Mr. Player, who introduced and explained 16 statistical exhibits covering all details of the operation of the exchange at Ada, and for the entire system of the defendant corporation, was not to support the particular figures in the complaint, but to develop and prove definitely and conclusively what has been the actual investment of capital at or clearly identified with the business of the defendant company, what have been the actual revenues resulting from such investment, the legitimate expense incident to the conduct of the defendant's business at such point, and the actual financial return on such operation, resulting from such investment.

Apportionment of Toll Property.

In reference to the division of the toll property the commission points out that its own engineer apportioned this on the basis of the relation that the number of subscribers' stations in Ada bears to the total number of subscribers' stations of the company in the state. This plan was adopted because the company owns and operates all of the exchanges and toll plant as one property and all revenues accruing from both exchange and toll service are placed to the credit of the company and all expenses for operation of both are paid out of such revenues and no attempt is made to segregate the operation expenses of exchange and toll business. The defendant company's engineer found that his board consisted of seven sections, three for local and four for toll line business. On this basis he included in his total valuation of the plant at Ada only three-sevenths of the part that had anything to do with toll line business.

In arriving at a right of way valuation the defendant company's engineer similarly excluded the toll lines, while the commission's engineer included them, using, however, figures taken from a report of the company to the commission and "not a report of payments actually made." The commission points out that for the year ending June 30, 1910, the company showed a valuation chargeable to exchange right of way, of $151,203, and to toll right of way, $44,242, while, in the succeeding year, these items were transposed and exchange right of way was made $41,376 and toll right of way $191,368. "Nor does it appear," says the commission, "anywhere in this record that there was any legitimate reason for this feat of fiscal legerdemain."

The 4½ Per Cent. Paid to the Parent Bell.

In discussing the 4½ per cent of revenues paid by the Pioneer company to the American Telephone & Telegraph Co., the commission points out that 99.56 per cent of the capital stock of the Pioneer company is owned by the parent concern. For the year ending June 30, 1911, the amount paid over to the parent company amounted to $1.86 per station. This payment was designated as "rentals exchange and toll instruments." Referring to the testimony of the general manager of the Pioneer company on the subject of this payment, the commission says:

"In his testimony he refers to the furnishing of induction coils in connection with transmitters and receivers, used in the defendant company's plant, and also to the furnishing of the Pupin coil, which is used to increase the efficiency of transmission value of toll lines. Witness, however, does not make the statement that the induction coils referred to are furnished to the defendant company without cost to that company, but does make the specific statement that the Pupin coil is furnished at cost. In other words, the record may be said to show that the physical return to the defendant corporation for the 4½ per cent, paid for rental of instruments, is a payment for rental of transmitters and receivers only. The witness states that the defendant corporation has the benefit of engineering and legal advice from the American Telephone & Telegraph Co. without specific charge therefor, other than the proportion of this 4½ per cent. rental, which is considered by the defendant corporation as payment for such advice. The record fails to disclose the basis upon which the amount of this payment or proportion of gross receipts constituting such payment was agreed upon between the defendant corporation and the American Telephone & Telegraph Co., and inasmuch as the record shows the latter company to own 99.56 per cent. of the stock of the former company, or in other words shows practically a complete ownership of the defendant corporation by the beneficiary of this payment of 4½ per cent. of gross earnings, it is clear that this payment is something the amount of which is wholly out of the control of and not subject to the desire or judgment of the minority interest in the defendant corporation, amounting to .44 of 1 per cent.

As far as is indicated by reports appearing in this record, this payment by the defendant corporation to the larger corporation owning a control thereof, has been made annually. The payments for the fiscal year ending June 30, 1910, and June 30, 1911, were $68,258, or $1.78 per station, and $85,774, or $1.86 per station, respectively. This makes a total in the two years of $3.64 per station. The record shows in the testimony of the commission's engineer that these transmitters and receivers can be purchased outright for $2.74 for both, which is 90 cents less than the amount represented by the payment of rental per station for two years, and shows that the equipment could be purchased for 90 cents per station less than has been paid in the last two years for rental thereof."

The commission then quotes from President Theodore N. Vail respecting the control of the Western Electric Co. by the American Telephone & Telegraph Co. and the ar-

rangement by which the latter company releases telephones to its subsidiaries, and comments that the conclusion is not only clear but inevitable that the reason the Pioneer company rents this apparatus from the American Telephone & Telegraph Co. instead of buying it outright from the Western Electric Co., "is that the policy and practice adopted afford a basis for a greater charge against the revenues of the defendant corporation than would result from the adoption of the practice suggested." The commission upholds the findings of its engineer that the amount shown to have been paid to the parent company under the 4½ per cent. arrangement is an improper charge against the Pioneer company's investment as a whole and against the property at Ada in its proportion. The commission "finds the fact to be that the defendant corporation is yielding and paying a concealed profit" not shared by the minority stock interest and that this is unjust and improper.

Depreciation.

On the subject of depreciation the commission says, in part:

"Another vital controversy in this record is revealed by an inspection of the figures introduced by the engineer in behalf of the complainant and the defendant corporation purporting to show the proper charge for depreciation of the defendant company's property at Ada.

The engineer of the defendant company shows the estimated life in years of the various classes of plant, their salvage value, annual depreciation in per cent., the weighted annual rate of depreciation for the entire plant, considering the annual depreciation to be 8.606 per cent. He shows the equated present value in per cent. of the total replacement value of 100 per cent. to be 87.05 per cent., or the depreciated value of the Ada exchange plant as $30,010. He purports to show the annual depreciation in per cent. of various classes of physical property as follows: Exchange pole lines 12.4 per cent., no salvage value; exchange aerial cable seven per cent. with a salvage value of 30 per cent. of the original cost; exchange aerial wire (iron) 12.5 per cent. with no salvage value; proportion of general tools and teams 10 per cent., with salvage value of 20 per cent. of their original cost.

On this theory, the defendant's engineer attempts to justify the accumulation of a replacement fund to provide new property as referred to at the expiration of its estimated life in years. The record shows in uncontradicted testimony of the commission's engineer that such life in years as applied to property of these classes is purely theoretical, and not in any sense actual, or so regarded in practice by this company. This is proved by the evidence that with a total or partial impairment of any property of this class, the same is repaired or replaced, the expense of such repair or replacement being met out of revenues, either current or reserved.

Mr. Bloom, engineer for the Southwestern Bell telephone system, in the last hearing before the corporation commission, admitted, on cross examination, that if the Ada plant should always be kept up to its present standard of efficiency and value out of operating revenues the stated rate for depreciation would be charged off just the same. This statement is too ridiculous to deserve consideration. Where could there be the necessity of a depreciation reserve if the property is kept to a standard of value at all times out of operating revenues?

There is no charge for such repairs or replacement against the so-called depreciation reserve fund, which under the theory of the defendant's engineer would be created; and the record, by failure to show the existence of such a fund at the end of any fiscal year shows positively that such depreciation or replacement fund is not actual and is purely theoretical.

From the annual report of the Pioneer Telephone & Telegraph Co. to the corporation commission for the fiscal year ending June 30, 1911, which report has been submitted under oath, we find that these various factors used by the defendants are in no wise put into actual practice. The actual practice is that certain sums are transferred out of the current revenues each year and credited to an account, the title of which is "Maintenance or Depreciation Reserve."

An analysis of the comparative general balance sheet of the company shows that a credit balance of over one million dollars in round numbers, for maintenance reserve, is not represented by any cash or current assets. Neither has the same been invested in securities of other companies. It is, therefore, evident, from an inspection of the balance sheet, that this reserve has in reality been used in expenditures for plant. It may be the intent and purpose of the company to adjust such expenditures as are shown to have been made from the maintenance reserve for the extension of the plant by a transfer or charge to the "Maintenance Reserve" at some future time, but with that we have nothing to do here.

If anything were necessary to supplement the evidence in the exhibits as to the payment for maintenance and reconstruction out of revenues current or reserves, and not out of the so-called depreciation and maintenance reserve fund, it is found in a second recourse to a declaration of the president of the American Telephone & Telegraph Co. to the stockholders of said corporation, touching upon the practice employed by that corporation.

Objection to Double Charge.

The defendant corporation asks the commission to approve a plan which, as shown to be practiced by such corporation with sanction and approval of the president of the controlling corporation, pays for maintenance and reconstruction out of revenues, and at the same time to approve a setting aside out of revenues a sum theoretically providing a fund for caring for these identical expenses. The injustice of such a practice, thus illuminated, is so apparent that a request for its approval must be regarded as little less than a presumption upon the credulity of this commission.

The charge made by the defendant corporation for depreciation on classes of property referred to, having been shown to be theoretical and not actual, and repairs and replacements on such portion of the defendant company's plant as are included in this class of property having been shown to have been made out of revenues, either current or reserved, it appears that such a charge is based upon a fallacy and is improper. This fallacy can be clearly illustrated perhaps, as follows:

Defendant's engineer assumes that these classes of property have a specific life in years. From time to time it becomes necessary to repair some property of such class bringing it into a condition as good as new or to replace it entire. As a matter of fact, in such latter case a new period of life in years begins, whereas, under the theory of the defendant's engineer, the defendant company continues to charge up depreciation from year to year the same as though the property embraced in the plant as originally constructed continued without change or substitution.

For instance, the defendant's engineer estimates the life of a pole as approximately eight years. The record shows that in a great many instances poles stand and perform uninterrupted service for a period greatly exceeding the defendant engineer's estimate of life in years stated. Where the period of service exceeds such period, the conclusion is inevitable that after the expiration of eight years the defendant engineer would continue to charge annual depreciation against such pole and for a period of service equal-

ing double the engineer's estimate, as frequently happens, the pole would be worth to the defendant company, at the expiration of the 16 years, 200 per cent. of its original value in its capacity to earn a charge for depreciation. Should the pole in question after five years or one year of service be destroyed by fire or shattered by lightning it would be replaced with a new pole, the life in years of which would in point of fact begin with its erection. Under the theory of the defendant's engineer, such new pole would be carried in the depreciation account of the defendant company as having an age of five years or one year, as the case might be, at the time its use actually began.

The same discussion is applicable and conclusion inevitable as to aerial cable, or any other class of construction here referred to.

It appears from this statement of facts in this connection, and the commission finds that on the class of construction referred to, there is in fact no depreciation except such as is cared for from time to time out of revenues, and in accordance with the judgment of the commission's engineer, the commission finds that a charge for such depreciation is improper and should not be allowed.

As to classes of physical property which may be designated as interior equipment, there is no material difference between the engineers, as to the amount to be charged for so-called depreciation. The commission's engineer states that inasmuch as the deterioration of equipment of this class occurs by reason of invention or improvement, mechanical or scientific in its nature, rather than by reason of actual physical wear and tear, this depreciation is more accurately described as absolescence than as depreciation; but inasmuch as the difference in the amounts allowed by the engineers for this deterioration in the property involved herein is not of sufficient importance to affect the net return on investment therein, these differences will not be discussed at length.

Casualty Insurance During Construction.

Defendant's exhibit, J. F. Noble "A," takes into consideration an amount designated as casualty insurance during construction and considers such an amount as a factor in the cost and consequently in the value of the plant. The commission's engineer in his testimony makes the statement, which appears to be uncontradicted, that this amount represents an arbitrary and theoretical charge that should not be considered. It appears to the commission that if such an amount were shown to represent money actually paid for casualty insurance carried in the construction of the plant in question, there would be ground for its consideration; but in the light of the evidence the commission cannot escape the conclusion that its engineer is correct in his statement in this regard, and that the defendant's engineer has injected into his valuation of this plant an improper and unreal factor in using this amount.

Going Value.

Defendant's exhibit, Whorton "C," in stating the engineer's depreciated value of the Ada local exchange plant, adds to such depreciated value an amount for working capital chargeable to the Ada exchange, which gives a total of $30,010, which is designated as "the amount (not including going concern value) upon which company is entitled to earn."

This is the only reference in the record to the subject of going concern value, as applied to the defendant's property at Ada. If there is any such an element of value in the plant in question, it would appear that the burden would rest upon the defendant corporation to show the amount thereof if the same is to be accepted as a legitimate factor in the valuation of investment upon which the defendant corporation is entitled to earn. The suggestion referred to, that such value is not included in the figures upon which the company claims the right to earn is a suggestion on the part of the defendant that such a value exists. But it is not evidence constituting a basis for determining what the amount of such value may be, nor is there anything appearing in this record at any point that constitutes such a basis. It appears, therefore, that while the commission would not be justified in ignoring the defendant's suggestion of the existence of a going value, it cannot make a specific finding as to what such value is or as to what amount if any, therefor should or could be allowed.

Exhibits GPP 4 and 5, which indicate return on investment in the Ada plant as found by the commission's engineer, accepted all figures and charges claimed by the defendant corporation as properly made against this property, but employed the commission engineer's reasoning and conclusion as to rental of receivers and transmitters, depreciation and the division of apportionment of the value of the toll plant of the defendant company. Exhibit GPP 4 based on actual revenues collected by the defendant company at Ada shows a net return on physical investment in plant at that place of 12.2 per cent. Exhibit No. 5 shows a return of 14.71 per cent., using as a basis of revenue the rate for service which the defendant corporation is now authorized to charge and collect in the city of Ada. Said exhibit further shows a return of 10.19 per cent. on investment in physical property in Ada on revenues based on the proposed rates as suggested by the commission's engineer in said exhibit.

The supreme court of this state in the case of Westenhaver vs. Pioneer Telephone & Telegraph Co., 29 Oklahoma, 430, held that earnings of approximately 5.5 per cent. of the value of the plant in that case involved was not unreasonably high, and that rates yielding such return should not be reduced. The court did not specify what rate would be reasonable nor whether the rate shown by the state as earned, 8 per cent., would be a reasonable and fair return. The court in that case held that in ascertaining the present value of a plant, such as in that case involved, a reasonable amount should be allowed on account of its earning capacity as a going concern.

From the discussion by the court of the issues in that case, the commission is of the opinion that the net return on investment in physical property at Ada, as shown in Exhibit GPP 4, based on actual collections, provides not only a reasonable interest return on such investment in physical plant, but also on such allowance as this commission may, by any evidence in the record be justified in assuming to exist on account of the earning capacity of the Ada plant as a going concern, and that this return thereon is in fact unreasonable and excessive.

It appears to the commission further that such return as the record shows, would result from the application of the revenues authorized to be charged and collected in the city of Ada at the present time would likewise be unreasonable and excessive, and further that such return resulting from application of rates suggested by the commission's engineer would be reasonable and remunerative. These conclusions are consistent with analysis of figures on valuation, income, expenditures and result of operation shown, and the commission so finds.

Seek to Enjoin Dakota Central at Mitchell, S. D.

By vote of the city council the city of Mitchell, S. D., will immediately start proceedings to enjoin the Dakota Central Telephone Co. from the use of its streets and alleys, on the ground that the franchise of the corporation expired on May 11, 1913.

Get in Tune with Service Through Your Trade Paper

By ELBERT HUBBARD

The heir-apparent to the British throne has, for his crest, three ostrich plumes, and on an intertwining scroll is the motto, "Ich Dien," which being interpreted means, "I serve."

The heir-apparent to the American sovereign has, for his coat-of-arms, three base ball bats, rampant, on a field of emerald. And underneath are the words, "Ischi-Beble"—"I should worry!" Both sentiments express two vital principles: work and play, service and recreation. And this combination, broadly speaking, meets life's contingencies, and is full of possibilities.

Anything that contributes to healthier bodies, purer thoughts, better work and service, is desirable; and we purpose to show how the Trade Paper performs that function.

Every day thousands of dollars' worth of machinery is junked to make way for up-to-date equipment. We live right-up-to-the-minute, and even borrow of tomorrow. And the Trade Paper mirrors the mind of the progressive thinker, and breathes the spirit of the age.

The editorial department of the Trade Paper is in the hands of experts, who have their fingers upon the pulse of human thought and activity. Its pages are full of facts—facts that bring home truths—facts that expose falsehood—facts that spell success.

There is a vim, verve and vitality in the Trade Paper that is peculiarly its own. There is a sympathy and understanding permeating it, that is unique, an intimacy that makes it a personal friend.

Right here is where the Trade Paper has its source of power. It gathers together, informs and reflects the things which may be applied to specific, individual need. As a means of encouragement and inspiration, the Trade Paper is invaluable. The subscriber who reads it, and chews and digests its varied menu, will become stronger and more robust. Both he and his business will benefit.

The policy of the Trade Paper is founded upon scientific knowledge and common sense, and its business conducted on the ethical principles of morality. It is accurate and reliable, honest and straightforward.

The Trade Paper does not deal in superficialties. It does not merely scratch the surface, it digs deep down into the heart of the things. It is intensely practical, and has quality, tone and depth. There is a vitality of thought running through its pages, which comes from the dynamo of truth. And it is illumined by a steady, clear flame of utility and service.

Perhaps the great charm of the Trade Paper lies in the fact that its articles are brief, bright and brotherly. It is tedious to have to wade through columns of words—just words.

In the year we are now entering, we are formulating plans, arranging campaigns, adopting new methods and procedure. If these plans are sound, workable, efficient, we shall make progress. If they are undeveloped, "half made up," we are on the "bumptedybump," and the receiver is waiting around the corner with a stuffed club.

In a multitude of counsel, there is much wisdom. When a man gets wise to himself, he gets wise to the fact that only as he co-operates, can he succeed.

The possibilities of the Trade Paper are only limited by the ability of the editorial department, the sound business pilot at the helm, and the receptivity and support of its subscribers. And there are few so shortsighted as to defer or curtail their subscription to this source of mental and moral power.

To add to your earning capacity, is to add to your value. To get an expert knowledge of your business, is to add to your power and influence.

The Trade Paper assists you to acquire these things. It is an aid to your mentality, your inventive genius, and a developer of latent talent. By reason of its intelligent handling of this subject, and the closeness of the relationship existing between it and the subscriber, the Trade Paper has become an absolute necessity to thousands.

The tendency of the times is toward unification of principles in business.

Quality and service are being considered before profits. Better conditions of labor are being evolved. A better understanding is abroad between master and man. There is the spirit of courtesy and comity everywhere.

The Trade Paper fosters that fellowship—that bond of brotherhood. It is not destructive—it is constructive.

It stands for human betterment, purer laws, better goods. It is the universtiy of business. And so long as its policy remains such, so long will the Trade Paper receive the hearty aid and co-operation of its subscribers, and increase in power and usefulness—as it does. The Trade Paper has justified its existence by its usefulness—its service. Its possibilities depend upon your loyalty and co-operation.

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From Factory and Salesroom

Conventions: Minnesota, St. Paul, Jan. 27; Northwestern Cedarmen's Ass'n, Escanaba, Mich., Jan. 27, 28; South Dakota, Sioux Falls, Feb. 11, 12; Wisconsin State Telephone Association, Madison, Feb. 11, 12

Cuban Automatic System Still Grows.

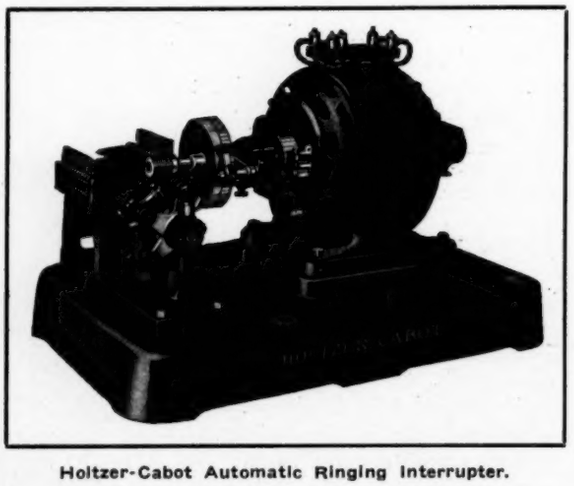
An order for 1,500 lines of automatic telephone equipment has been ordered from Automatic Electric Co., of Chicago, by the Cuban Telephone Co. to provide facilities for handling the constantly growing demand for its service. This company is already operating automatic exchanges in Havana, Cardenas, Cienfuegos and Matanzas, and is installing automatic apparatus in Santiago. The latest order will be used to extend the existing plants. The Cuban company began installing automatic equipment in Havana early in 1910, and orders aggregating 21,400 lines have been placed during the past three years.

An Automatic Ringing Interrupter.

The accompanying illustration shows a cam operated automatic ringing interrupter which is coming into quite general use in telephone exchanges. It is manufactured by the Holtzer-Cabot Electric Co., of Boston and Chicago, and the claim made for the interrupter is its superiority to interrupters having slow moving sector wheels, as it is said that the latter arc badly and eat away the selector bars, thus requiring frequent repairs. It is claimed that this device not only eliminates that trouble, but is so constructed that any repairs can be made without sending the entire machine to the factory.

The interrupter consists of a cast iron framework upon which are mounted springs that are operated by cams; these in turn being actuated by electric power. The interrupters are usually connected by worm gear to a ringing machine, although they are sometimes driven by an individual motor. The contact is made between two platinum pointed springs and the cams are so designed that the circuit is closed and opened abruptly, thus removing the difficulty of arcing.

The time of contact and intermission between contacts is determined by the cam and may be of any length desired. There is, in general, one spring to each position on the board, with an extra spring to ground the condensers after being used, thus relieving them of their static charges.



Holtzer-Cabot Automatic Ringing Interrupter.

A New Form of Publicity.

In many parts of the country, especially in the larger cities, telephone development has been approaching the point of saturation. How then is the telephone company to grow in such a case? Is the growth of the telephone company to be only proportionate to the increase in population?

Many companies have answered this question most satisfactorily by pushing extension stations. An extension station certainly increases the gross revenue at a very little expense and this expense is only an initial one. The maintenance cost is practically nothing. Therefore if a company can install an extension station which will pay for itself the first year with practically no maintenance or operating expense, it would seem that companies that are not advertising extension sets vigorously, are missing a golden opportunity.

Advertisement on Lantern Slide.

The question arises as to the best method of convincing subscribers that an extension set is a necessity. In a face to face talk with a subscriber, it is an easy matter to convince him that he needs an extension in his private office, upstairs in the bed room, etc., but canvassing the entire list of subscribers is an expensive proposition.

The Ericsson Mfg. Co., of Buffalo, N. Y., helps out the exchange manager greatly by means of literature, which is supplied free to a telephone company, on its "Handymike" extension set. Folders are supplied which can be sent out with the monthly statements. These have always been quite effective, but a man who receives a notice of a bill to be paid, is not in the most receptive mood for a suggestion that he spend more money. The question has come up, therefore, as to the best moment to make the suggestion and the best method of presenting it to him.

During the past few years moving picture theatres have come into being and increased in number until now there is scarcely a part of any city or town which does not have its "Happy Hour Theatre," "Idle Hour," "Amusu," etc. Downtown the business man drops in for a few minutes after lunch, the ladies drop in after shopping, and in the evening the whole family goes to the neighborhood theatre for an hour's recreation. Persons in the audience are in a most receptive mood and advertisers have found that

colored slides, shown during the performance, bring greater returns than any other form of publicity.

The Ericsson Mfg. Co. again proves its enterprise in providing colored lantern slides for the exchange managers. Operating companies that take advantage of this

Lantern Slide for "Movie" Theater.

method of advertising, which brings so much for so little, are quite certain to reap the harvest of additional earnings.

Paragraphs.

THE UNITED STATES LIGHT & HEATING CO., Niagara Falls, N. Y., has changed the location of its New York City branch sales office from 30 Church Street to 210 W. 50th Street. This change brings the New York U-S-L service station and sales office in the same building. The general offices of the company remain at 30 Church Street.

THE F. BISSELL CO., Toledo, Ohio, has issued the January number of its house organ, "The Bissell Book." The cover represents the new year as an infant bearing a traveling bag on which appears the sentiment: "Prosperity for both of us." Attention is called in the booklet to the Bissell company's Idaho, Michigan and Canadian cedar poles, and its pine and fir cross arms and other products.

THE LEEDS & NORTHRUP CO., 4001 Stenton Avenue, Philadelphia, Pa., maker of electrical measuring instruments, is sending out a new edition of its catalogue No. 44 descriptive of its resistance boxes and Wheatstone bridges. A number of pages are devoted to some of the company's methods of construction.

THE REBUILT TELEPHONE EQUIPMENT CO., of Chicago, has purchased all the magneto equipment of the La Porte Telephone Co., La Porte, Ind.

The Tollometer.

The Tollometer Co., of Hartford, Conn., is manufacturing and vigorously pushing the sale in various communities of the tollometer, a simple instrument which can be attached to any telephone, to the side of a desk, to the inside of a telephone booth or simply placed on the desk in any convenient position, and by means of which a subscriber, who has frequent occasion to use toll service, can, it is said, accurately time his toll calls. After making a call the subscriber can request the long distance operator to give him the time that has been charged against his call, and if this does not agree with the record of his tollometer, the operator's attention can be called to the fact and the correction made at the time the mistake occurs, which is much easier to do than afterwards, when the records have been completed. The tollometer is designed to show the subscriber every minute and second that he has used in his conversation, which enables him to bring his talk to a close when nearing the time limit, or take further advantage of any time to which he is still entitled.

The device consists of a framework containing timing mechanism and dial, which is graduated into minutes and seconds. By pressing a lever on the left side of the tollometer the mechanism is started. In case of any interruption pressure on the same lever causes an instant stop. A third pressure causes a resumption of the timing operation from the point at which it was stopped. This operation can be continued until the end of the call, when the exact number of minutes and seconds consumed in the conversation is shown by the dial. By pressing a lever at the right hand side of the tollometer, the hands of the clock are set back to zero and at the same time the mechanism is rewound and made ready for the next call. The instrument is three inches high, five inches long and 2½ inches wide and is finished in nickel or black Japan. A record pad for recording calls is conveniently attached, with spaces for the date, name and length of call.

The Tollometer Co. has endeavored to co-operate with telephone companies in various cities in the sale of this instrument. In Cincinnati, the telephone company issued instructions to its operating department to work in every way with any subscriber who was using a tollometer, to get accurate time.

An International Truck in Service.

The accompanying illustration shows an International truck which is used by the Gibson Home Telephone Co., of Gibson City, Ill. It gives an excellent idea of how a motor truck may be utilized for telephone construction work. Equipped with wire reels, it greatly facilitates wire installation, and a good-sized crew of men can accompany it to a job.

Experience and time are demonstrating that the motor truck is destined to become a great factor in telephone work and it has already proved its indispensability. The company whose system is extensive can economically operate a motor truck, more so, it is said that any other means

The International Truck Ready for Telephone Service.

of conveyance. Those desiring more information about I-H-C trucks can procure it by addressing the publicity department of the International Harvester Co. of America, Chicago.

East Syracuse May Have Co-Operative System.

At a public hearing held recently in the village of East Syracuse, N. Y., a movement was launched to establish a local telephone system to be operated on the co-operative principle.

Legal Cases and Decisions

By A. H. McMillan

House Moving in Ohio.

"What are the laws in Ohio with regard to house moving? Can a man move a house through the streets of a town or city and compel the telephone or electric light company to move its wires at their own expense? Please publish your opinion and cite us cases decided in the courts of the state of Ohio."

A man cannot move a house through the streets of a town or city in Ohio and compel a telephone company to move its wires at its own expense. If he wishes you to move the wires, he must pay the expenses of doing so, and may be required to give you a bond to protect you from all damages.

We have no Ohio citations on the subject. In fact, we do not believe that your courts of last resort have passed upon it. However, there is no reason to believe that they will render any different decision from that rendered by the courts of other states. See Kibbie Telephone Co. vs. Landphere, 151 Mich., 309; Frontier Telephone Co. vs. Hepp, 121 New York State, 460; Nagle vs. Hake, 101 Northwestern, 409; Pierson vs. Tri-State Telephone & Telegraph Co., 126 New York, 1091; Northwestern Telephone Exchange Co. vs. Anderson, 98 Northwestern, 706; Morris vs. Roundsville Bros., 64 Southeastern, 473; Edison Electric Light & Power Co. vs. Blomquist, 185 Federal, 615.

Free Telephones to Subscribers.

"We are in somewhat of a query as to the effect the new Indiana public utility law will have on us, and thought you could enlighten us on the matter in question. First, we have 206 outstanding shares and each share is entitled to the use of one telephone free of charge from year to year, with the exception of an assessment on each share, occasionally, to defray necessary expenses. Our renters pay $12 per year for residence and $15 for business telephones. We also have two free and two toll trunk lines—both renters and stockholders have same privilege of these lines. Are we violating the law in either of these cases?"

We think you are not violating the public utility law. In furnishing telephones free to each shareholder, you are really paying them a dividend, or to take another view of it, they are receiving a profit on their stock in the shape of free telephone rental. The same holds true of the free privileges on your trunk lines. Your stockholders are members of the company so that they are not receiving any advantage or any discrimination.

Enforced Connection.

"There is a small town two and a half miles below here in which we have a connecting exchange. There are about 35 lines. The farmers have pulled away from the exchange, taking about 17 of the lines. We have one commercial line and the farmers have three lines between our exchanges. These three lines did not pull away. Therefore, we will have no connection with the farmers' exchange. Can the farmers build a line to the corporation limits and force us to connect? We are not in sympathy with the farmers and would like to have them go back to the old exchange and do away with the nuisance of two exchanges."

We do not know of any law or proceeding by which the farmers can enforce connection as proposed.

No Preference for Telephone Rentals.

"When a merchant goes into bankruptcy or fails in business, the rent of his place of business comes first. Isn't this also true, in some states, regarding telephone rentals? Please advise me if the laws of South Carolina allow any preference to telephone rent claims. Also advise me of the law regarding removing telephones upon non-collection of rent. Kindly cite sections, etc."

We do not understand that telephone rent claims are entitled to any preference. If the merchant went into bankruptcy and the telephone was put in or retained by his receiver or trustee, such part of the rental as was incurred by the receiver or trustee would be a preferred claim, but only so much.

The removal of telephones for non-payment of rent is a matter that depends upon the rules and regulations of the telephone company. It is held lawful for the telephone company to make a regulation that telephones shall be removed for non-payment of rent after a stated period and upon notice. The regulation to that effect must be properly brought to the attention of the subscribers upon its establishment. See Rushville Co-operative Telephone Co. vs. Irvin (Indiana), 59 Northeastern, 327.

Rental for Turnpike.

A telephone company and a turnpike company entered into a written contract under their respective seals by which the turnpike company granted to the telephone company for the period of 99 years "the right to construct, operate and maintain its lines upon, over and along the turnpike road," preserving to itself the right to designate the location of the company's poles; and the telephone company agreed that, upon notice, it would remove its poles to conform to any improvements or changes in the road and would pay a rental of $10 per year for each mile, or fractional part of a mile, it might use. Action was brought on the contract to secure payment of a portion of the rent.

The telephone company defended on the ground that the agreement was without consideration and void, because the turnpike company had no power or authority to make the grant intended thereby, and that the contract was made under a mutual mistake as to the rights of the parties, because the telephone company had a legal right to build and maintain its lines on the turnpike without consent of the turnpike company. It appeared that the telephone company had paid its rental for 11 years but thereafter refused. The court held that the telephone company could not rescind its agreement and refuse to pay further rent upon the grounds mentioned.

The telephone company relied upon the case of People's Telephone & Telegraph Co. vs. Berks & Dauphin Turnpike Co., 199 Pennsylvania, 411, 49 Atlantic 284. The court held that that case was not controlling, because there the turnpike company arbitrarily refused to allow the telephone company to enter upon its road, cut down and removed the telephone poles as they were put up, and expressed its determination to resist the erection of any poles along the line of the turnpike. There was nothing in that case from which it could be reasoned, had the parties adjusted their differences by written agreement, that such a contract could not be supported in law.

Said the court: "The turnpike company had the right to be consulted and to impose proper terms and conditions, before the telephone company could break the surface of its road; and, if the two corporations saw fit, as they did, to enter into a written agreement under their respective seals, to stipulate terms and conditions for the maintenance of their mutual rights, there is nothing in the law which forbids the enforcement of the contract." Berks-Dauphin Turnpike Road vs. American Telegraph & Telephone Co., 87 Atlantic, 580.

Disobedience to Rules.

The failure of a telephone company to warn a splicer, who was directed to repair a cable, that there was a burn-out in it, did not render the company liable for his death, due to an electric shock, where he learned the fact of the burn-out by his own observation before he began work. So held the Supreme Court of New York in an action brought against an electric light company and a telephone company for damages. It appeared that the burn-out was caused by lightning or contact with electric light wires. The evidence was held insufficient to hold the telephone company liable, but on the contrary, sufficient to show that the accident resulted from the deceased's disobedience of the company's rules, and carelessness in neglecting well known precautions.

The company had rules as to testing cables for electric currents before making repairs, and as to wearing rubber gloves. The plaintiff contended that these rules were habitually disregarded and that cable splicing could not well be done with gloves. Evidence was held insufficient to establish this contention. Larkin vs. Queensboro Electric Light Co., 143 New York, 578.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

JAMES MCCAMPBELL, director of the Tehama County Telephone Co., Red Bluff, Cal., has been appointed general manager of the company.

F. K. PECKHAM, formerly traffic chief for the Michigan State Telephone Co., at Saginaw, has been made manager of a newly created district, with headquarters at Petoskey, Mich.

C. C. FAILING, formerly district superintendent for the Michigan State Telephone Co., with headquarters at Saginaw, has been appointed district manager of the Port Huron district.

E. P. PLATT, for several years manager of the Grand Rapids district of the Michigan State Telephone Co., has been promoted to the position of superintendent of the Saginaw discovering the southwestern part of the state.

H. R. MASON, district commercial manager for the Michigan State Telephone Co., at Saginaw, Mich., has been promoted to the position of superintendent of the Saginaw district. Mr. Mason will continue to make his headquarters in Saginaw.

E. E. BAWSEL, for many years Southern superintendent of the American Telephone & Telegraph Co. and for the past several years division superintendent for the Southern Bell Telephone & Telegraph Co., with headquarters in Atlanta, Ga., has been appointed general manager of the Cumberland Telephone & Telegraph Co. for the state of Tennessee, with headquarters at Nashville.

MAJOR-GENERAL F. B. MAINGUY has retired from the presidency of the Guernsey, England, telephone department. In token of the appreciation in which he has been held during his 15 years' chairmanship of the department, the council and staff presented him with a unique souvenir, comprising a timepiece, barometer and thermometer mounted in the form of a telephone handset, the metal parts being of oxidized silver and all being mounted upon a walnut base.

Obituary.

E. O. SICKLES, manager of the United Telephone Co., Belle Center, Ohio, died recently in a Cincinnati hospital.

Elections.

CHENOA, ILL.—The Chenoa Telephone Co. has elected John N. Gentes and P. C. Gillespie directors.

LUDLOW, ILL.—The North Harwood Telephone Co. has elected Charles Arnold and E. W. Griswold directors for three years, James Pearson and James F. Kirk for two years, and M. Shinker and H. N. Evans for one year.

MACOMB, ILL.—The Macomb Telephone Co. held its annual meeting recently and elected the following directors: C. K. Todd, A. A. Messmore, J. H. Hungate, H. L. Argenbright, E. S. Slusher, C. M. Stairwalt, W. A. Binnie. After the meeting the directors held their election of officers for the coming year, which resulted: President, C. K. Todd, vice-president, H. L. Argenbright; secretary, Birdie Brown; treasurer, A. A. Messmore; manager, E. S. Slusher.

MORO, ILL.—The Farmers Telephone Co. has elected the following officers for the ensuing year: President, Fred Zoelzer; secretary, Edward Helemkamp; treasurer, Smith Dorsey; and director, Fred Untermeyer.

MULBERRY GROVE, ILL.—The following officers have been elected for the Mutual Telephone Co.: President, D. W. Brunson; secretary and treasurer, W. H. Baldwin, and manager, M. M. Neeley.

SHABBONA, ILL.—At the first annual meeting of the Inter Township Telephone Co. the officers and directors elected upon its organization, were re-elected to serve for the coming year. They are as follows: President, Dr. E. J. Brewer, Shabbona; secretary-treasurer, Albert Larson, Shabbona; general manager, James Hastie, Hinckley; directors, Dr. Brewer, Albert Larson, of Shabbona; Harry McDonald, Dr. Wilkinson, of Waterman; James Hastie, A. J. Coster, of Hinckley; George B. Foster, of Lee.

FT. WAYNE, IND.—The Nine Mile Telephone Co. held its annual meeting recently and elected officers as follows: President, William E. Dalman; vice-president, William Hiser; secretary and general manager, R. H. Minich; treasurer, A. H. Lopshire.

GREENSBURG, IND.—The stockholders of the Decatur County Independent Telephone Co. have elected directors as follows: F. D. Armstrong, Walter B. Pleak and Charles Zoller, Jr.

WINTHROP, IOWA.—The Winthrop Telephone Co. held its annual meeting recently and elected the following directors for the coming year: W. B. Miller, A. E. Whitney, H. C. Unbehaun, H. Higman and A. W. Norman.

SHELBYVILLE, KY.—At the annual meeting of the stockholders of the Shelby County Telephone Co. the following directors and officers were elected for the coming year: W. J. Thomas, J. S. Turner, C. S. Weakley, J. Wirt Turner and Ben Allen Thomas, directors; W. J. Thomas, president; C. S. Weakley, vice president; J. Wirt Turner, secretary; P. R. Beard, treasurer; J. D. Wimp, general manager. Ben Allen Thomas was elected to the directorate.

BIRDSBORO, PA.—The Conestago Telephone & Telegraph Co. held its annual meeting recently and elected the following directors for the ensuing year: John A. Flannary and H. A. Long, of Monocacy; F. M. Brown, Birdsboro; Julius Langner, Scarletts Mill; John A. Smith, Gilbraltar; John K. Stoltzfus, Morgantown; A. L. Whitcomb, Elverson, and Harry Hause, of Marsh. The directors will hold a meeting February 11 to elect officers for the ensuing year. The company now operates nearly 900 telephones and has planned a considerable number of improvements to its system. All overhead wires in Birdsboro will be put in cable and a new two-position switchboard will be installed at Morgantown in the near future.

New Companies and Incorporations.

MOWEAQUA, ILL.—The Moweaqua Telephone Co. has been incorporated with $20,000 capital stock by P. L. Drew, S. S. Clapper and R. E. Clapper.

ALTAMONT, KAN.—Articles of incorporation have been filed by the Farmers' Mutual Telephone Co. with $3,750 capital stock. The incorporators are: A. E. Sachs, Altamont; O. M. Morrison, Altamont, R. 1; Chas. E. Stuart, Altamont, R. 2; J. J. Wheatley, Mound Valley, R. 1; and J. F. Newberry, Oswego, R. 4.

GEORGETOWN, KY.—The Eagle Telephone Co. has been incorporated to construct and operate telephone lines in Scott county and also adjoining counties of Kentucky. The incorporators are: George Penn, M. D. Sanford, C. T. Smith, W. V. Mulberry, Jacob Mulberry, Jr., John Harrison, A. D. Stevens, A. S. Crosthwaite, Mrs. Sarah E. Burgess, Cam Skinner, Leonard Bankhill, Henry Hinton, N. M. Burgess, Mrs. Delia Holland, R. P. Giles, T. C. Giles, Noah Bailey, R. P. Fields, J. A. Harrison and L. T. Dryden, all of Scott county, and John Kitchen, of Harrison county.

BELLEVUE, OHIO.—The Newport Farmers Mutual Telephone Co. has been incorporated with $10,000 capital stock by A. C. Thompson, George G. Thomas and H. W. Eddy.

STEUBENVILLE, OHIO.—The Jefferson Telephone Co. has been incorporated with $400,000 capital stock to construct and operate a telephone system in Jefferson county. The incorporators are P. P. Lewis, E. E. Francy, W. H. Burgoyne, J. A. Heinlein and Fred Meininger.

CORA, OKLA.—The Moyer Telephone Co. has been incorporated with no capital stock by E. H. Lyon, D. C. McMurphy and O. W. Hall, all of Cora.

HILL TOP, OKLA.—The Hill Top Telephone Co. has been incorporated with $3,000 capital stock by W. D. Marshall, E. S. Seimenskie and L. A. Lawrimore, all of Hill Top.

INEZ, TEXAS.—The Farmers Telephone Co. has filed articles of incorporation with $500 capital stock. The incorporators are: H. C. Klein, W. H. Hutcheson and L. C. Noll.

Construction.

DERMOTT, ARK.—The Southwestern Telegraph & Telephone Co. will spend $11,450 in the enlargement and improvement of its local telephone plant.

LOS ANGELES, CAL.—Plans have been completed for the erection of a new exchange building by the Pacific Telephone & Telegraph Co., to cost about $104,000.

PUENTE, CAL.—A new telephone exchange building will be

erected in the near future at Puente by the Home Telephone Co. The building and exchange will cost about $15,000.

SAN FRANCISCO, CAL.—The Pacific Telephone & Telegraph Co. has appropriated $850,000 for improving its telephone facilities in San Francisco and neighboring towns.

CARMI, ILL.—The Commercial Telephone & Telegraph Co. will erect a new copper line from Fairfield to Flora.

COFFEEN, ILL.—The Mutual Telephone Co. will make a number of improvements to its system including the installation of a new switchboard.

GOOD HOPE, ILL.—The Western Illinois Telephone Co., which has headquarters at Macomb, Ill., will install an entire new system in Good Hope.

MORO, ILL.—The Farmers Telephone Co. is contemplating the construction of a new line to Bethalto for through toll messages.

PEORIA, ILL.—The Central Union Telephone Co. has purchased a site and will erect a new exchange building in Peoria.

ROCKFORD, ILL.—The Rockford Home Telephone Co. is planning to erect a new two-story exchange building and to make numerous other improvements to its plant.

MICHIGAN CITY, IND.—The Merchants' Mutual Telephone Co. has authorized the appropriation of $10,000 for new constructions and improvements. W. B. Hutchinson is president of the company.

OWENSVILLE, IND.—The Independent Telephone Co. is planning to make a number of improvements to its plant, including the installation of a new switchboard.

DODGE CITY, KANS.—The Arkansas Valley Telephone Co. will spend from $40,000 to $50,000 in improving its system in this city. A new two-story building will be erected and all wires in the business district will be placed underground.

NEW ORLEANS, LA.—Plans for enlarging the offices and equipment of the Cumberland Telephone & Telegraph Co. in this city, to entail an expenditure of from $1,600,000 to $2,000,000, have been completed.

MUSKEGON, MICH.—The United Home Telephone Co. is planning to make a considerable number of improvements and extensions to its system here.

JAMESTOWN, N. Y.—Work has been commenced on the erection of a new three-story fire-proof extension to the Jamestown plant of the New York Telephone Co. The new building will cost approximately $55,000.

NEW YORK, N. Y.—The New York Telephone Co. will make many improvements and additions to equipment, at an aggregated cost of $750,000, among which is included additions to the switchboards of two exchanges in New York City, a new central office building at Brooklyn, and additions and improvements to the company's exchanges at Paterson, Hasbrouck Heights, N. J., and Camden, Niagara Falls and North Tonawanda, N. Y.

TROY, OHIO.—The Troy Telephone Co. will erect a new two-story exchange building in this city, to cost $35,000.

PENDLETON, ORE.—The Pacific Telephone & Telegraph Co. has announced that it will make extensive improvements to its local plant in this city.

ANDERSON, S. C.—The Southern Bell Telephone & Telegraph Co. proposes to make improvements to its plant in this city to cost approximately $81,000.

HOUSTON, TEXAS—The Southwestern Telephone & Telegraph Co. will erect an addition to its Hadley exchange building to cost about $14,000.

DALLAS, TEXAS.—The Southwestern Telegraph & Telephone Co. will erect a new exchange building here, to cost in the neighborhood of $800,000.

RICHMOND, VA.—The Chesapeake & Potomac Telephone Co. will erect a new exchange in this city, to cost in the neighborhood of $50,000.

WHEELING, W. VA.—The Central District Telephone Co. has appropriated $30,000 for extensions and improvements to its properties in Wheeling and vicinity.

MADISON, WIS.—The Wisconsin Telephone Co. is planning to build an addition to its Madison exchange.

Financial.

BLOOMINGTON, ILL.—The stockholders of the Palmer-Darnall Electric Co. have voted to increase the capital stock from $10,000 to $60,000, and to change the name to the Baker Telephone System.

GIBSON CITY, ILL.—The Gibson Home Telephone Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $25,000 to $50,000.

VIRGINIA, ILL.—A special meeting of the stockholders of the Cass County Telephone & Telegraph Co. has been called for January 24, to vote upon a proposition to change the name to the Cass County Telephone Co. and to increase the capital stock from $25,000 to $35,000.

AUBURN, KY.—At the annual meeting of the Auburn Home Telephone Co. a 10 per cent. dividend was declared.

COTTAGE GROVE, WIS.—The Cottage Grove Telephone Co. has reduced its capital stock from $10,000 to $5,000. H. G. Clarke is president and Frank J. Neefe secretary.

HARTFORD, WIS.—The Hartford Rural Telephone Co. has increased its capital stock from $1,500 to $5,000. Daniel Schultz is president and Albert W. Brown secretary.

MINERAL POINT, WIS.—The Mineral Point Telephone Co. has increased its capital stock from $10,000 to $15,000. N. H. Snow is president and William P. Bliss secretary.

Underground.

MERIDEN, CONN.—The Southern New England Telephone Co. will make a considerable number of improvements to its plant in this city, which includes the laying of approximately 30,000 feet of underground conduit and the stringing of about 35,000 feet of aerial cable.

MILWAUKEE, WIS.—The Wisconsin Telephone Co. will place nearly 4,000 miles of wire in underground conduit.

KENOSHA, WIS.—The Kenosha Home Telephone Co. is planning to rebuild its lines in Kenosha, at a cost of from $60,000 to $80,000. The work includes the placing of several miles of underground cable.

Miscellaneous.

DILLON, MONT.—At a meeting of the owners of the West Side Beaverhead Telephone Co., held recently, it was agreed to incorporate, under the name of the West Side Beaverhead Telephone Company. Articles of incorporation were adopted and a board of directors and other officers elected as follows: Theodore Nelson, president; C. W. Conger, secretary-treasurer; directors, Nels P. Nelson, James P. Murphy, I. F. Hunsaker, Theodore Nelson and C. W. Conger. The company expects to make some extensions and improvements to its system in the near future.

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